

# OUR JOURNEY OF GROWTH



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PRACTICAL HYGIENE SERIES

BOOK ONE

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# OUR JOURNEY OF GROWTH

BY

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*"Modern hygiene teaching should show immediate  
results in the improved health of pupils."*



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## PREFACE

No one who has studied the period of growth will question its importance. It is a period of preparation, and it is also a period of weakness. There is no other time in life when health agencies need to be administered with so much skill and no other time when a wrong administration is likely to do more harm. Growth itself must not be interfered with, but it must be safeguarded at every turn. Surely there can be no more profitable field for practical health work than is afforded by the groups of growing boys and girls in our public schools.

Children are naturally interested in their growth. They are pleased with the gains they make from year to year and are looking forward to the time when they can enjoy the privileges and assume the responsibilities of adult life. This interest should be utilized in health building just as it has already been utilized as a stimulus to mental preparation. The proper utilization of this interest, moreover, will bring into helpful action the most important of the factors pertaining to child life—the child's intelligent effort in his own behalf.

Too often children are themselves their worst health enemies. Through needless exposure, ex-

cesses of different kinds, and general failure to do for themselves what they should, they fail to realize the possibilities of their natural endowment. The opposite condition should, of course, prevail. The school must see to it that they become health builders instead of health destroyers. To this end it must arrange programs of health instruction, direct the children in the formation of health-giving habits, and keep them interested in their health and their growth. This book aims to be a real help in the accomplishment of all these purposes.

In the preparation of Book I, as well as of Book II, of the Practical Hygiene Series, the broader view has been maintained. The aim is not the development alone of a "good animal," but of a human being thoroughly capable of maintaining himself in the social and economic environment into which he is born. The chapters on mental growth are, therefore, a fitting climax to the chapters on physical growth first presented.

In the selection and preparation of material for both books, means for motivation have been sought in the things about which we are most concerned—the body itself and the various agencies that affect it. By bringing the child into a knowledge of his natural possessions and the conditions under which they are to be used, we have our best approach to the problems of health and growth. Interest aroused by a proper presentation of this kind should endure.

Health training should, of course, begin in the



primary grades. This beginning work, however, can be done better through individual instruction, supplemented by health examinations at stated periods and by health talks by the teacher or the school nurse, than by formal recitations. In the second book of this course, particularly adapted to the last two years of the elementary school, many suggestions will be found on the health problems of the school as a whole.

FRANCIS M. WALTERS



## TO THE TEACHER

THE purpose of this course is not primarily information, but the attainment of right attitudes and habits. The teacher of hygiene must remember that while "intelligence conditions what a child *can* do, the instinctive and emotional equipment determines what he *will* do." What the child learns about his body and the things that affect his growth is, therefore, of less moment than an appreciation of the value of good health, a wholesome desire to grow normally, and a good stock of health-giving habits. From the teacher's standpoint, we may well take the following as objectives:

1. Enjoyment of the course by all who take it.
2. Living contacts between the subject matter presented and the play life of the child. We should recognize the play instinct as Nature's call for health-giving activity and correlate our formal instruction with it. The spirit portrayed in Chapter XIII should permeate the whole course.
3. Teacher and pupils all living healthfully as far as possible, or all playing the health game.
4. Constant effort toward habit formation of the right kind.

In the last-named objective we have our most dif-

ficult problem. Psychology, however, supplies some valuable aids.

**Laws of Habit Formation.**—The two most important of the laws of habit formation are the law of exercise and the law of effect. According to the law of exercise, “an act becomes habitual by actual frequent repetitions and in no other way.” Any act pertaining to the health, such as brushing the teeth, must be repeated again and again over a long period and without lapses, before it is actually built into a habit. It is no small matter, therefore, for a child to build a good habit or to destroy a bad one.

According to the law of effect, “any act that is associated with satisfaction is more likely to be repeated and built into a habit than one which is associated with annoyance.” Unfortunately many of the health habits are not associated with satisfaction, but on account of discomfort or interference with play are associated with annoyance. They lack, therefore, in natural motivation. Artificial motivation must be depended upon instead, and it is just here that the school can render its most valuable aid.

**Forms of Health Motivation.**—The most important of the forms of health motivation is a strong desire on the part of the child to be healthy and to grow normally. The development of such a desire should be counted as the main purpose of our study. Through an appreciation of his bodily organs and of the different kinds of growth, this desire is normally developed and strengthened.



Coming second as a means of motivation for healthful activity, is the desire for approval, especially the approval of the teacher. To obtain the full effect of this we should require health reports, have inspection days, and give health examinations. We should also coöperate with and approve of any health work that is being done by the home.

A third means of motivation is the pupil's grade in the course. Health habits and the ability to keep well should count half in the grade that is given and knowledge of the subject matter the other half. The mistake should not be made of grading upon knowledge alone.

**Emphasize Present Needs.**—One of the most fundamental of the principles of teaching is the relating of the subject matter to the child's *present interest*. While the application of this principle meets with difficulty in the case of some subjects in our course of study, there should be no difficulty in the case of elementary hygiene. It is to the present interest of the child to grow normally, to keep in good condition for his work and his play, and to get as much protection as possible from the ailments of childhood. In solving his hygienic problems of the present, he will be making the best possible preparation for the future.



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## CHAPTER I

### GROWTH IN GENERAL

This book, boys and girls, is to tell you about growth. You are sure to enjoy this study because there probably is nothing that can interest you more than growing. No matter whether you want to grow into a farmer or a doctor or an aviator or a homemaker or the manager of a tearoom, you want most of all to be happy and successful, to be the finest kind of farmer or doctor or aviator that there is. This book is going to tell you what it means to grow, how you should grow, and what will help you to grow in the best way possible.

**What It Means to Grow.**—Growth, first of all, is not just getting bigger. Men and women are not simply babies grown large. Men and women are stronger than babies and can do more things. They can control their feelings so as not to cry at little hurts; they know more than babies and can think better. As we grow we become better able to care for ourselves and more capable in every way. We can get an idea of what it means to grow by studying the growth of some of the lower animals.

**Growth Changes in Animals.**—If we watch young animals grow, we can see them doing new things day

by day and see the making of new parts. It is fun to watch an ugly, wriggling tadpole change into a handsome green frog that can leap into the air and catch bugs, to see a woolly caterpillar turn into a beautiful butterfly. But it is just as easy to study warm-blooded animals and those that have hair upon their bodies, and these are more like ourselves. One of the best of the warm-blooded animals for showing changes due to growth is the white rat.

**The Growth of the White Rat.**—People do not like ordinary rats, for they sometimes make them-



FIG. 1.—A litter of new-born white rats

selves a nuisance in attics and cellars, and they often spread the germs of sickness. But the white rats that scientists grow for experiments in finding out things that help us in our living make interesting pets. They are especially good for studying changes due to growth because they grow so rapidly. The whole lifetime of a white rat is only about three years. This means that they pass through all their changes in a very short time. You can almost see the young rats grow.

**From Rat Babyhood to Rat Maturity.**—The picture on the opposite page shows a litter of new-born white rats. Their eyes and their ears are not yet open, and they have neither hair nor teeth. They can scarcely move about, but they can suck milk from the mother rat, breathe air, and do the other things they must for life and growth. To see how fast they grow, we can weigh them on delicate scales from day to day. The average baby rat, which weighs less than one-fifth of an ounce when it is born, weighs about one-third of an ounce at the end of the first week and two-thirds of an ounce at the end of the second week. In about ten months the young rat is full-grown, or mature, and weighs over ten and one-half ounces.

**Unfolding of Organs and Powers.**—To see that the young rats do more than increase in size and weight, we have only to use our eyes. Scarcely able to move at first, the little rats become more active each day. At the end of three days their ears open; in sixteen days their eyes open, and they get their first view of things about them. Ten days after birth they have cut their front teeth, and thirty-five days after birth they have cut all their jaw teeth. When they are three weeks old, they can drink water and milk and eat solid food and so can be weaned. But you should see how they can run and climb and how well they look in their new coats of hair. Finally comes the day when they can hunt food, fight if necessary, build nests, and do the other things that you would expect of full-grown rats (Fig. 2). This



means that all their organs,\* small and only partly formed at first, have grown to full size and can do well the work they were planned to do.

**The Cause of Growth.**—What makes these rats grow? What makes us grow? The cause of growth is a something we do not understand, which we call



FIG. 2.—A full-grown healthy white rat

life. The young rats grow because they have life, or are alive. We grow because we are alive. Only living things, plants and animals, are able to grow.

**The Building Blocks of Growth.**—The playhouses you build are not alive and so do not grow. But they are built up much as living things really

\* An organ is a part of the body that is arranged for some special work, as the eye for seeing.



grow. The playhouses get larger and larger as you add more blocks to their walls, and plants and animals all grow by adding tiny pieces of living matter to their different parts. These tiny pieces of living matter are called *cells*. Although plant and animal cells are of all shapes possible and are so very small that a microscope must be used for seeing them, they can be thought of as the *building blocks of growth*. But where do these cells come from and how are they used in growing?

**Where Animals Obtain Their Blocks for Building.**—The new cells that are added when animals grow are formed within the body of the animal just as they are needed. They are made from cells already there. The animal takes in food, air, and water from the outside, and from them the cells get what they need to grow. When a cell has grown to full size, it divides into smaller cells. These now grow to full size in the same way; then they divide to form still other new cells. As the cells increase in size and number, the body grows larger and larger until it has finished growing, or, as we say, has reached maturity. New cells then stop forming except as they are needed to replace cells on the outside that have worn away or to repair parts of the body that have been injured.

**Human Growth the Most Wonderful of All.**—The growth of the rat should interest us more than the growth of a plant. We say that a rat is a higher form of life than a plant, meaning that it has more organs and can do more things. But human beings are the

highest of all the forms of life. Besides having bodies that are better in many ways than the bodies of most of the lower animals, we have a power of mind that is better than that of any other animal upon the earth. It is through growth that the organ of the mind, called the brain, gets itself ready for each one of us.

**Facts Learned.**—(1) By growing we increase in size, form new parts, and develop new powers. (2) Only living things — plants and animals — can grow. (3) These grow by forming tiny parts, called cells, which are built into the parts that are being formed. (4) While the growth of both plants and animals is very wonderful, the growth of human beings is the most wonderful of all.

### QUESTIONS

1. What is it about the period of growth that makes it so important?

2. Into what does a tadpole change by growing? Into what does the caterpillar change?

3. Name some of the changes in the baby rat as it grows into a large rat. In a kitten as it grows into a cat.

4. What are some of the ways in which a five-year-old child differs from a new-born babe? The ten-year-old child from the five-year-old child?

5. Of what is the body made up that is similar to the blocks with which children play? Where does the body get the blocks it uses when it grows?

6. How do we grow?

## CHAPTER II

### OUR GROWTH IS LIKE A JOURNEY

While baby rats grow to maturity in ten months and some other animals in still less time, it takes human beings from twenty-one to twenty-five years to finish their growth. Of course you want to know why we grow so slowly.

**Why We Need a Long Time for Growing.**—There are two reasons for our long period for growing. In the first place, we need a long period of growing for the unfolding of our powers. Man is the most capable of all living things. There is almost no comparison between what he can do and what any other animal can do. It takes longer to make a being that can drive an automobile or write a book or build a tall building than to make a white rat which can, at best, learn only a few tricks.

In the second place, we grow slowly because our body is being prepared to last a long, long time. While the white rat is old at the age of three years, the dog at the age of ten years, and the horse at the age of twenty years, man should not be counted old until he is seventy-five or eighty years of age. The plants and animals that grow slowly are found to live longer than those that grow rapidly.



**Our Growth Like a Journey.**—As we grow from year to year we seem to be carried along much as we are when we make a trip on a train or in an automobile (Fig. 3). In making any kind of trip we start at a certain place, travel through other places, and

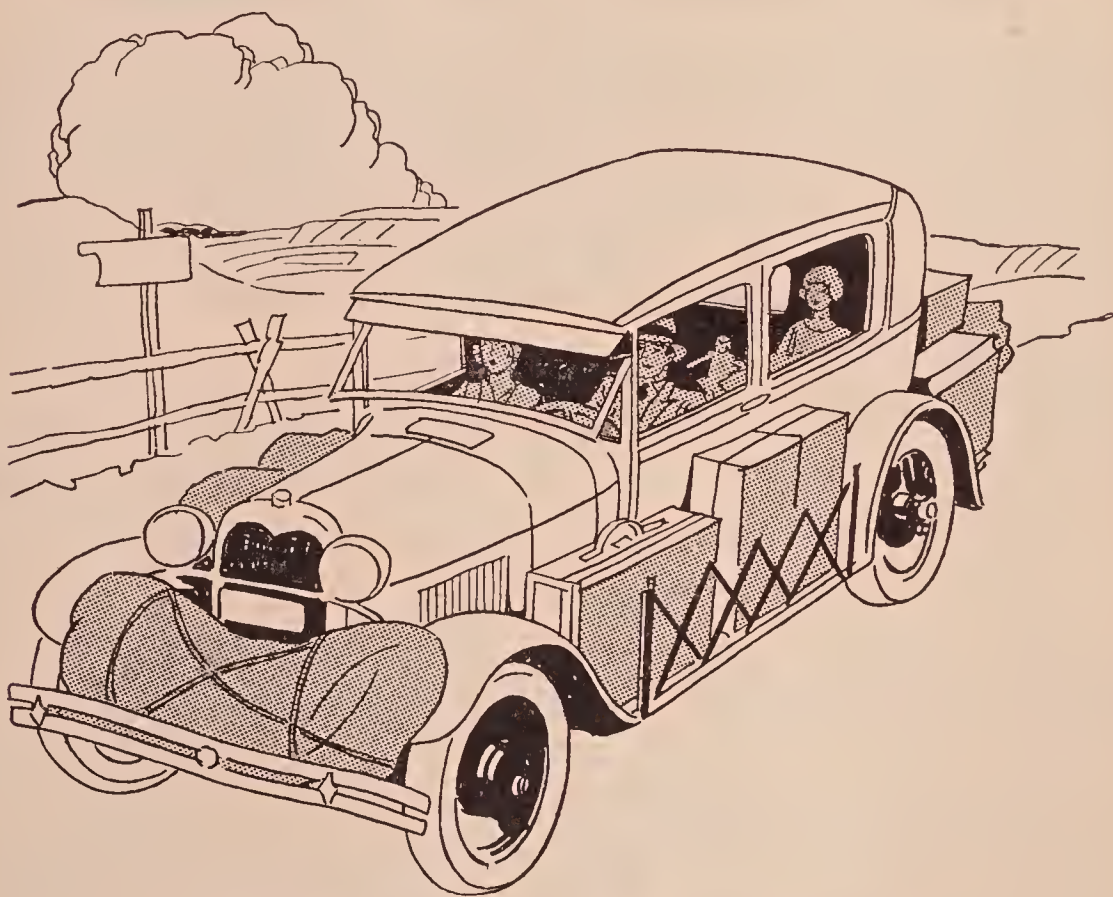


FIG. 3.—A delightful kind of journey

finally reach our destination; that is, the place for which we set out. We do the same thing in our growing. Of course our growth journey is much longer than any ordinary journey. It takes more time than is needed for making several trips around the world. Nevertheless the places on our growth journey are well marked so that there is no trouble in telling at any time just where we are.

**Our Growth Journey by Stages.**—We start with a stage called *infancy*, or *babyhood*. We then travel through such interesting stages as *childhood*, then *boyhood* or *girlhood*, then the “teen” age or *adolescence*. At last we reach our destination, which is *adulthood*, or *maturity* (Fig. 4). Although the journey is long, it is interesting; and the farther we go, the more interesting it becomes.

**The Babyhood Stage.**—The first stage, babyhood, is probably the least interesting of all for the one making the journey. Nobody knows, of course, what a baby thinks about as it looks out upon the world. But it hardly seems interesting to be able to do nothing but eat, crow, cry, and lie in bed waiting to be picked up. We can remember so little about our own babyhood that our parents have to tell us what we did when we were babies. Two years of steady traveling in infancy bring us to the next stage.

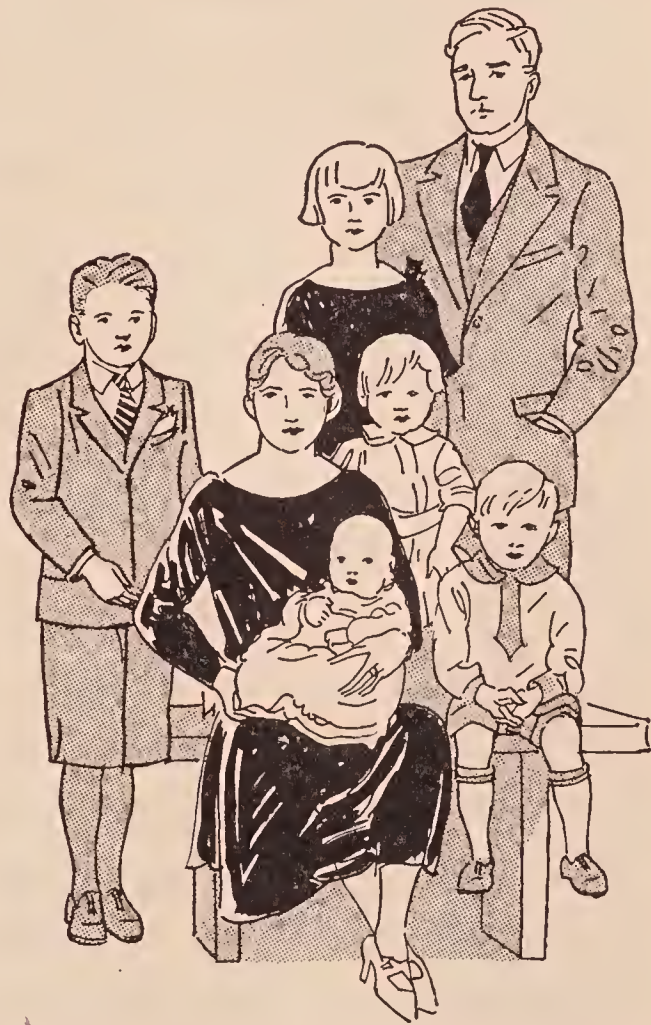


FIG. 4.—Growth stages in the same family



**The Childhood Stage.**—We can remember something about the childhood stage of our journey. We can stand upon our feet and move about. We can talk and understand much that grown people say. We can eat all kinds of food, and we can use our hands to pick up things and move them about. Our mothers often have trouble keeping us out of mischief. But we grow fast and learn rapidly while in the childhood stage and soon are ready for the stage when we are to start to school.

**The Boyhood and Girlhood Stage.**—We have already heard much about what we can do as boys and girls. Of course the main thing is to go to school, and this in itself is like being in a new country. But it is not long until we know the teacher and the other pupils and are feeling much at home. At school we learn to read and write and to make pictures and play games. We also learn how to hold our own when there is any kind of trouble. As time goes on, we read bigger and harder books and understand more of what is said to us. We get better able to do things for ourselves. We can even help others.

We like the country in which we are boys or girls so much that the traveling time seems to go faster and faster. Almost before we know it we are in another new land. This we find even more interesting and delightful than the land we leave behind.

**The “Teen” Age, or Adolescence.**—When we arrive at adolescence, we begin to change into mature persons — into men and women. Until a girl is

about twelve years old and a boy about thirteen, their bodies grow in much the same way, and their interests are much the same. During the time of journeying through adolescence, boys develop the broad shoulders, strong muscles, deep voices, courage, and other qualities that mark men as men. Girls develop the form, features, interest in home and children, and other qualities that mark women as women. We are traveling faster and faster. Almost before we know it we begin to realize what it means to be fully grown up, to be mature persons, and to do the various grown-up things that mature people have to do. Our journey of growth is drawing to a close.

**Our Maturity.**—Our maturity is the period of life that comes after growth is finished. It is the destination we set out for more than twenty years ago. And if we have traveled in the best way, this period will last two or three times the number of years we spent on the entire journey of growth. During maturity we are in possession of all the powers that we developed while we were growing. It is the period in which we can do and be all the things we have dreamed of for so long. But a successful maturity depends very much upon the years that have gone before, upon the character we have formed, the reputation we have made for ourselves, and the kinds of work we have learned to do. Most of all it depends upon what we did for ourselves during our journey of growth.

**Facts Learned.**—(1) In the building of our bodies and the unfolding of our powers and in the experi-

ences that come to us from year to year, our growth is like a journey through a new and wonderful country.

(2) We need a long time for our growing. (3) Infancy, childhood, boyhood and girlhood, and adolescence are like the places through which travelers pass, and reaching maturity is arriving at one's destination. (4) What we accomplish as mature men and women depends largely upon the success of our journey of growth.

#### QUESTIONS

1. Why do we need so much time for growing?
2. In what respects is our growth like a journey?
3. Name our different stages of growth. How does babyhood differ from childhood?
4. How does the adolescent period differ from all the other periods of growth? To what does it lead?
5. Describe the period of life called maturity. Upon what different things does success during this period depend?



## CHAPTER III

### ALL THAT OUR GROWTH JOURNEY SHOULD BE

What kind of journey should our growth journey be? First and most important, it should be a *safe* journey. This means that when we reach maturity we shall have bodies that are strong and healthy in all respects. Let us see how we can make our growth journey safe.

**The Main Thing on an Automobile Trip.**—The most important thing to any one who takes a long overland trip in an automobile is the condition of the car itself. If the car is all right to start with and is kept in good repair from day to day, the journey is almost sure to be a safe one. Of course bad roads and bad weather may cause delay, but the worst thing of all is to have to stop because the car will not go. So the driver is careful to keep his car supplied with water, oil, gasoline, and a few things for quick repairs. And in dangerous stretches of road he drives with great care. There is real hygiene for automobiles just as there is for human beings.

**The Main Thing on Our Journey of Growth.**—Nothing is more important on our journey of growth than the condition of our bodies from day to day or, as we say in other words, our *health*. For our body

is the car we travel in from babyhood to maturity and then through the rest of life. *Good health is the best friend of growth, and poor health is its worst enemy.* Poor health is car trouble that will delay our journey of growth or perhaps stop it altogether. If we have good health — a good automobile — and take care of it, we shall reach our destination in good condition.

**How We Make Our Growth Journey Safe.**—We make our traveling safe by looking after our health, which we have just said is the most important thing on our journey of growth. The healthy body is able to produce new cells for growing and for making repairs. The healthy body does not get sick easily, does not have engine trouble and weak springs to slow our traveling when the going is rough. *The healthy body is safe.* We are the drivers of our body automobiles. Safety depends upon our keeping them in good repair.

**A Safe Journey not Enough.**—If we arrive at maturity with strong and healthy bodies, we have done a fine thing — something that every boy and girl should strive to do. But something more is required. If we went in a car from Boston to San Francisco and did not look at the Mississippi when we crossed it and did not see the Grand Canyon or the Yosemite Valley or any of the lovely things on the way, and if we did not learn how to meet different kinds of people and to get along with them, and if we learned nothing new about driving and how to buy provisions, we might get to San Francisco safely, but we should have missed



wonderful opportunities on the way. Similar things are true about our journey of growth.

**Our Growth Journey Should Be Successful Preparation for Living.**—As we grow in height and weight we should also grow in ways that fit us to live as human beings. We must learn to be honest, industrious, skillful. We must find out how to get along well with other people. We must do our school work well, read good books, see beautiful paintings, hear good music, and learn as much of the great outdoors as we can, while on our way to maturity. In doing these things we become capable and likable human beings — those ready to make the most of their maturity.

**Our Growth Journey Should Be Happy.**—It goes without saying that every child wants to be happy. He wants to have a good time. But there are three other reasons for wanting to be happy all through the journey of growth.

1. Happy children are healthier, as a rule, than unhappy children.

2. To be happy ourselves has a good effect upon those about us. Happiness is contagious, or “catching.”

3. Happy children are more agreeable and kind than those who are unhappy. They get along better with other children and are better liked generally.

**How We Can Make Our Growth Journey Happy.**—There are three main ways by which our growth journey can be made happy.

1. It makes us happy to have good health, just as it makes us healthy to be happy. Then health and happiness work together against aches, pains, and the blues.

2. It makes us happy to be successful in our work at school and at home. If we know we have done a good piece of work, we feel a warm glow of well-being. We feel we amount to something.

3. It makes us happy if other people treat us well. This state of affairs may sound beyond our control. But if we make happiness for other people, other people make happiness for us. The Golden Rule works.

**Two Mistakes about Happiness.**—A great many children think that happiness depends upon having their own way. This is a foolish mistake. Often another person's way is as good as ours. Perhaps it is better than ours. If the only happy persons were those who say, "I'll do it my way," think how many unhappy people there would have to be! Sometimes giving up is happiness in itself. A second mistake about happiness is thinking it depends upon the things we have. If we have enough money to live healthfully and comfortably, we have enough to be happy. We should not worry about the fact that somebody else has more. The happiest people often have very little of what we call this world's goods.

**Our Threefold Aim in Traveling.**—We have said that we want our growth journey to be safe, successful in preparation for living, and happy. This is not

only the best way to grow, but it is the only way to reach the kind of maturity we want (Fig. 5). These three qualities, safety, happiness, and success, all depend upon one another. We cannot call ourselves safe if we are unhappy failures; we cannot call ourselves happy if we are unhealthy failures; and we cannot call ourselves successful if we are unhealthy

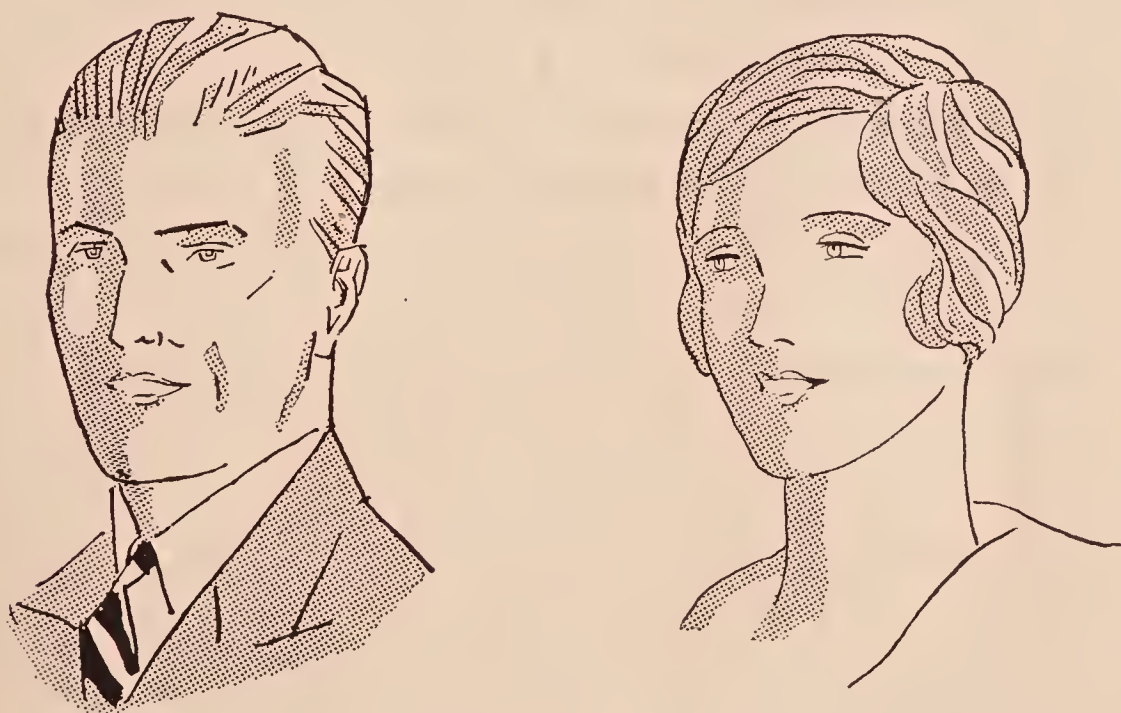


FIG. 5.—Successful maturities

or unhappy. We have to combine our three aims into one and journey from day to day as healthfully, happily, and successfully as we can.

**Some General Rules.**—You who are studying this book are already well along on the journey of growth. While you have not as yet reached the place where you can take complete charge of yourselves, you are better able to do this now than you ever were before. Here are some good rules for boys and girls who pride



themselves on doing the right thing without having to be told each and every time.

1. Put into practice what you already know about keeping well, obtaining the right amount of exercise and sleep each day, eating only at the regular meal-time, keeping the teeth clean, and dressing according to the state of the weather.

2. Work when you work and play when you play, using your time to good advantage.

3. Be kind and courteous to those about you and learn how to make and keep friends.

4. Enjoy your work as well as your play, keeping cool under excitement and smiling whenever you can.

**Facts Learned.**—(1) Our growth journey should be a safe journey, a successful journey, and a happy journey. (2) These three aims are all dependent upon one another, and all can be accomplished at the same time. (3) We do this by keeping healthy, making the best use of our time, and making ourselves agreeable and helpful to those about us.

### QUESTIONS

1. What is the main thing on an automobile trip? What is the main thing on our journey of growth?

2. Name some of the times when one must travel very carefully in an automobile. When must one manage very carefully on his journey of growth?

3. What three things should be accomplished by our journey of growth?

4. When may one be said to make a safe growth journey? How do we help to make this journey safe?

5. How does the successful growth journey differ from the safe growth journey? How do we make this journey successful?

6. What is the need for happiness on our journey of growth? Name some of the aids to happiness.

7. How may unhappiness hinder the growth journey?

8. What mistakes are sometimes made about happiness?

9. Show that the three aims of our growth journey depend upon one another. Into what one aim may they be combined?



## CHAPTER IV

### GROWTH IN HEIGHT AND WEIGHT

Increases in height and weight are two kinds of growth which we have all noticed in ourselves and in

our schoolmates. Do you know how to measure them and to compare your weight with the averages for different heights and ages?

#### To Measure the Height.

— For measuring the height we need a simple instrument like the one shown in Figure 6. If your school does not have such an instrument, perhaps some boys who are handy with tools will make one and present it to the school. All that is needed is a wide board eighteen by twenty-four inches, a straight narrow board six feet long, a yardstick, two small inch-square

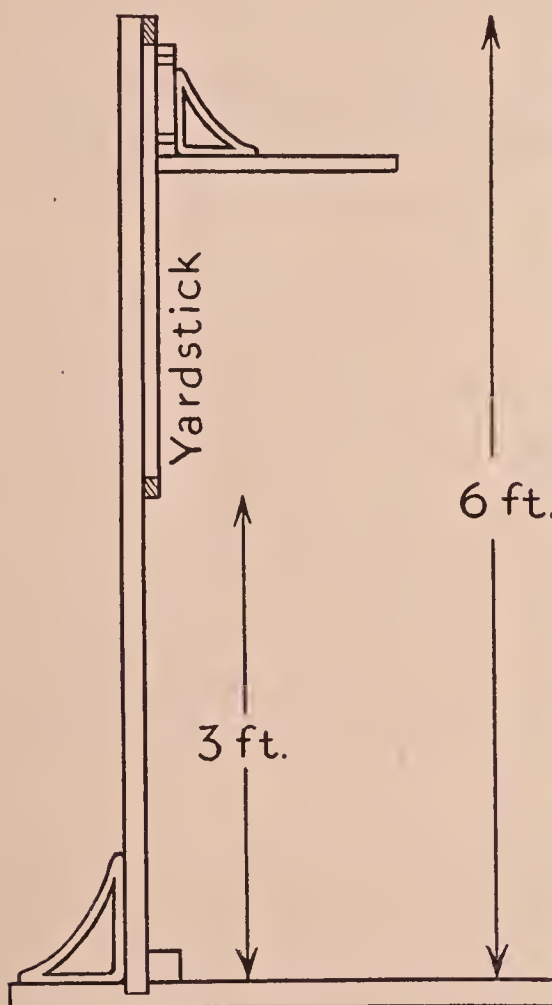


FIG. 6.—A device for measuring the height

pieces of wood (one six inches and the other ten inches long), two narrow pieces of tin, and two small

brackets. These are fastened together as they are in Figure 6. If you prefer, you can fasten the long straight board to the wall and do away with the short wide board and one of the brackets.

In measuring the height, the pupil should stand in his stocking feet directly under the arm that slides up and down on the yardstick. This arm is lowered until it touches his head; then the inches on the yardstick are read off. To this must be added the distance from the lower end of the yardstick to the board or floor, which has been fixed, when the instrument was put together, at three feet.

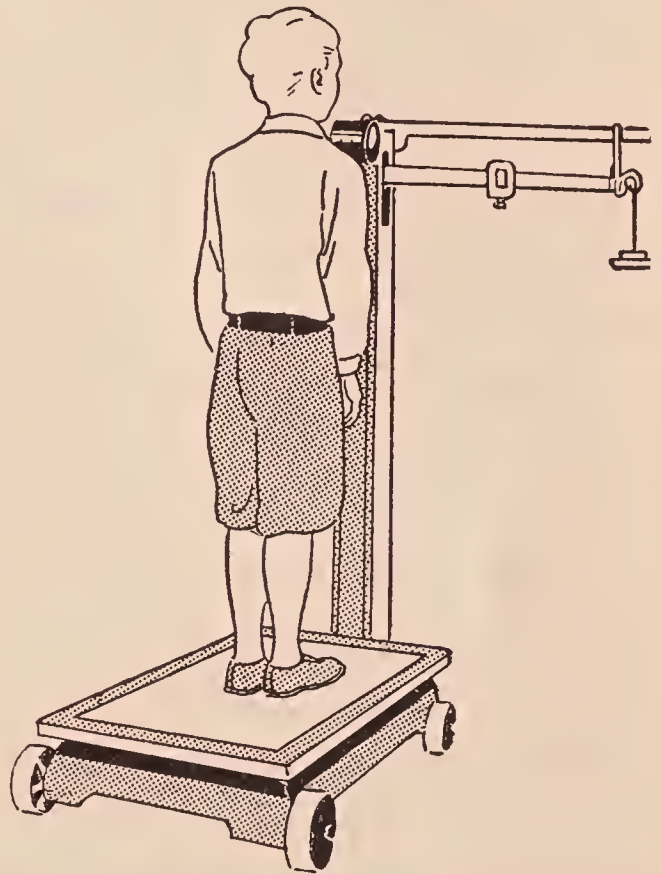


FIG. 7.—A platform scale in use

**To Obtain the Weight.**—For finding the weight you need some kind of scale. The kind of scale upon which you can stand and read your weight on a dial is very convenient, but it is likely not to be so accurate as the kind of scale (Fig. 7) on which small weights are used to balance the weight of the body. Heavy clothing, as coat and shoes, is usually removed before taking the weight. It is a good idea, also, to take care to weigh yourself at about the same time of day. After

eating a hearty meal you weigh more, of course, than you did before eating.

**How We Grow in Height.**—Our growth in height is due largely to growth in our bones. We are really pushed upward by their growing. The bones are hard and stiff, and they form the framework of the body. The muscles and other parts are connected with this framework and are protected by it. As the bones in the legs grow longer and the small bones that form the backbone, or spinal column, grow in thickness, the entire body is made longer, and this increases our height, or makes us stand taller.

**Growth from Year to Year.**—We do not grow the same amount each year, as we might expect to do. At times we grow very rapidly and at times very slowly. The time when we grow most rapidly is during the first year of our life. The average baby is about twenty inches long at birth, but grows to twenty-eight inches during the first year. Four inches more will be added during the second year, and three inches during the third year. A little over two inches will be added during the fourth and again during the fifth year (Fig. 8). From the fifth year on, the growth in height is still slower, although there are two periods when it is quite rapid. One of these periods is from seven to eight for girls and from eight to nine for boys. The other is from about eleven to fourteen for girls and from about thirteen to sixteen for boys. These are called the periods of rapid, or accelerated, growth.



**The Rate of Growth in Height an Individual Matter.**—When you compare your height with the average height of children of your age, you may find yourself two or three inches taller or two or three inches shorter than the average. If so, do not worry. Each child grows taller in his own way and according to a plan that heredity \* has laid out for him. If his parents, grandparents, and great-grandparents are all tall, he will doubtless grow to be a tall man. To do so he must grow faster than the average child each

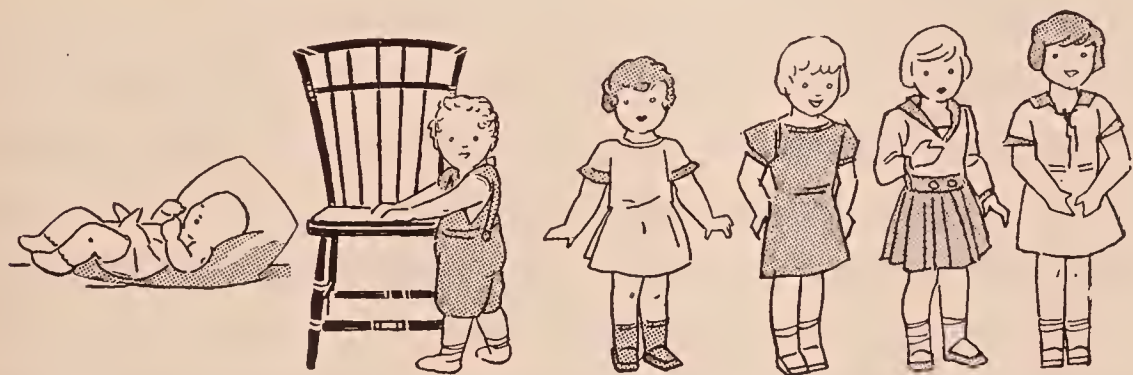


FIG. 8.—Growth from birth to five years of age

year. For the same reason, one whose parents, grandparents, and great-grandparents are all short will grow less than the average from year to year.

**Height and Weight.**—How much we grow in height, when considered alone, is usually not of great importance, because, as we have just said, each child grows fast or slowly according to the rate that is natural for him. But as we grow in height, we also grow in weight, and it has been found that with healthy children the weight corresponds rather closely to the

\* Heredity means the passing of family traits from parents to children.



height. Just how much one should weigh for his height has been the subject of much study, and tables showing the general average have been worked out. Such a table for boys is shown on page 244 and a similar one for girls on page 245. Height and weight tables have been much used in our public schools and you doubtless have heard about them already.

**How to Use Height and Weight Tables.**—Should you like to know how your weight for your height and age compares with the average obtained by measuring and weighing thousands of children? If so turn to the table for boys or for girls, as the case may be, and proceed as follows: First, study your table, noting first that the column of figures on the left gives the height in inches while the numbers at the top give the age in years. Now find in the height column the number you obtain by measuring your height; then look for your age at the top of the table.\* The number where the horizontal line from your height meets the vertical line from your age is the average with which you are to compare your actual weight. For example, if you are forty-nine inches tall and are ten years old, fifty-five is the weight number with which you compare your own weight. If you come within four or five pounds of the average, well and good. But you should not worry if your weight is considerably more or considerably less than the average.

\* Age is taken at the nearest birthday; height at the nearest inch; weight at the nearest pound. A child is considered six years old at any time between five and one-half and six and one-half years.

**What it Means to Grow in Weight.**—To grow in weight as we should means an increase in everything that goes to form our bodies. It means that we have more muscle, more bone and brain substance, more material connecting the different parts of the body together, and more of the different fluids found in the body. It also means an increase in our different kinds of power for as our organs get bigger they become more capable of doing the things they have to do. For these reasons, growth in weight is more important, even, than growth in height.

**Should Children of the Same Height and Age All have the Same Weight?**—Whether healthy children of the same height and age have the same weight, depends upon their general build. There are different types of people, both old and young, as you may know. Some belong to the thick-set stocky type, others to the tall and slender type, and others to types in between. Those belonging to the same type should weigh about the same for their height and age, but this will be different from the weights of those belonging to the other types. Those of the thick-set stocky build will weigh above the average for all children and those of the tall and slender build will weigh below. It is natural that some should be heavier and some lighter than the general average.

Our growth in weight, as well as our growth in height, it would seem, is an individual matter. We increase in weight according to an inherited plan which is different for different types of children.

**Our Weight and Our Health.**—Whether being considerably above or considerably below the average found in height and weight tables means anything bad for the health is something which only the well-informed doctor can tell. Even for him to tell, he must take several other things into account besides the weight. But while our weight at any time tells us very little about our health, any great change in weight that takes place in a short time, may mean that something is wrong with the body and that we should see a doctor. So to weigh ourselves from time to time to see how well we are keeping up with our record of gains may help us to know whether we are growing as we should and whether all is well with the body. It is only in this way that we can watch our health by watching our weight.

**How We Aid Our Growth in Height and Weight.**—There is really but one way to aid our bodily growth. We must eat enough of the right kind of food, sleep the right number of hours each night, spend much time out doors, and do the other things brought out in the chapters that follow this one. Our growth both in height and weight will take care of itself when we do all that we can to keep healthy.

**Never Worry about Your Weight.**—If a child is not so light or so heavy as he thinks he should be and worries about it, he only makes matters worse. The mind has a strong effect upon the body, and this effect may be either good or bad. When we are too anxious and worry, the effect is generally bad; but when we



are in a happy state of mind the effect is good. So instead of worrying if our weight is not what we should like, we should go on doing what we think is best for our health, keeping happy and cheerful and looking on the bright side. In this way we shall have our mind working for, and not against, our health.

**Facts Learned.**—(1) Increases in height and weight are the two kinds of growth that are best known and most easily measured. (2) As we grow in height we increase in weight and, for healthy children of the same age and build, the relation of height to weight is quite close. (3) Our best aid to bodily growth is to keep in good health from day to day. (4) Worry does not help the weight.

### QUESTIONS

1. How do we measure the height? How do we find the weight?
2. How do we grow in height?
3. At what times does one grow most rapidly? Most slowly?
4. Tell what it means to grow in weight.
5. Tom is twelve years old, fifty-two inches tall, and neither stout nor slim. About what should he weigh?
6. How do we aid our growth in height and weight?
7. Why should we not worry if our weight is not what we think it should be?



## CHAPTER V

### GROWING UP STRAIGHT

One very important thing in making a safe journey of growth is to keep the body in the right shape. With just a little care while we are growing, we can have the shape that Nature intended us to have. . If we are careless about our shape we may grow into something that is both ugly and unhealthy.

**Why the Body Should Have Its Natural Shape.**  
—There are three very good reasons why the body should have its natural shape. In the first place, we shall have better health. With the body in the right shape every organ and part of the body will be kept where it belongs and have the room that it needs. This helps us to keep well. In the second place, we look better. The well-shaped person is not only handsomer than the poorly-shaped one, but he looks stronger and more capable. Every one has more confidence in him. And in the third place, we can work better when we are in good shape, whether we work with our mind or with our muscles. Did you know that children in school who keep in good shape make, as a rule, better grades than those who do not? \*

\* In a certain large school a careful record was kept in all the rooms of the pupils who were always standing and sitting up straight and of those who were not. The children did not know that such a record

**Small Children Are Naturally Straight.**—Have you any little brothers or sisters at home? If you have, ask them to stand up while you look at them from all sides. You will probably find that they stand up straight (Fig. 9). Then look at them carefully as they sit in their little chairs. Nearly all children under six years of age stand straight and sit straight. Only a few are crooked when they are born, and only a few more get out of shape from sickness. Nature does her part in starting us straight on our journey of growth. We should be careful to keep in good shape as we travel along.



FIG. 9.—Small children are naturally straight.

**How We Keep the Good Shape We Already Have.**—

We keep in good shape by sitting and standing in correct positions. Many different rules have been given for keep-

ing the right shape, but the two best ones are very short and very easily remembered. They are: (1) Stand tall. (2) Sit tall. To prove to yourself what it means to stand tall, hold a short, straight stick level on top of your head with one end extending forward.

was being kept. It was found, almost without exception, that the pupils who kept in good shape were making better grades in their studies than those who were frequently in a bad shape.

Go near enough to a wall for the front end of the stick to touch it and, standing in a slumped position, mark

the place. Then stand tall, or straighten up, and see how much higher the end of the stick is pushed (Fig. 10). A boy standing tall is from one to two inches taller than he is when he slumps.

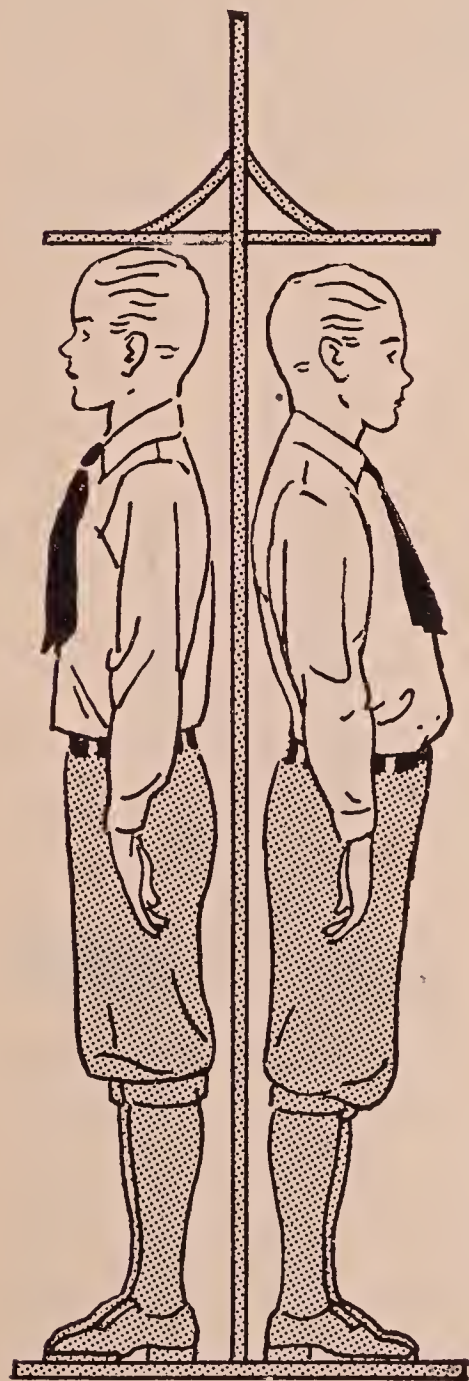


FIG. 10.—Standing tall makes one taller.

In standing and sitting tall, we should also keep the chin down and the middle of the neck back. If we practise standing tall and sitting tall as much as we can, we shall have little trouble in keeping the good shape that we already have.

**How One Grows out of Shape.**—Alexander Pope, an English poet who lived two hundred years ago, said, “As the twig is bent, the tree’s inclined.” He had watched trees in their growing and had observed that if a small tree, or sprout, was held in a bent-over position, it would later

grow into that shape. Pope also saw that this was true of people—true, in a way, of their minds and



characters and true of their bodies. To grow out of shape, we need only to keep some bad position for a long time while we are young.

You have seen children bending over as they studied. You have also seen them slide their hips forward in their chairs when sitting, and you have seen them slump forward both when sitting and when



FIG. 11.—A tree that started wrong in its growing

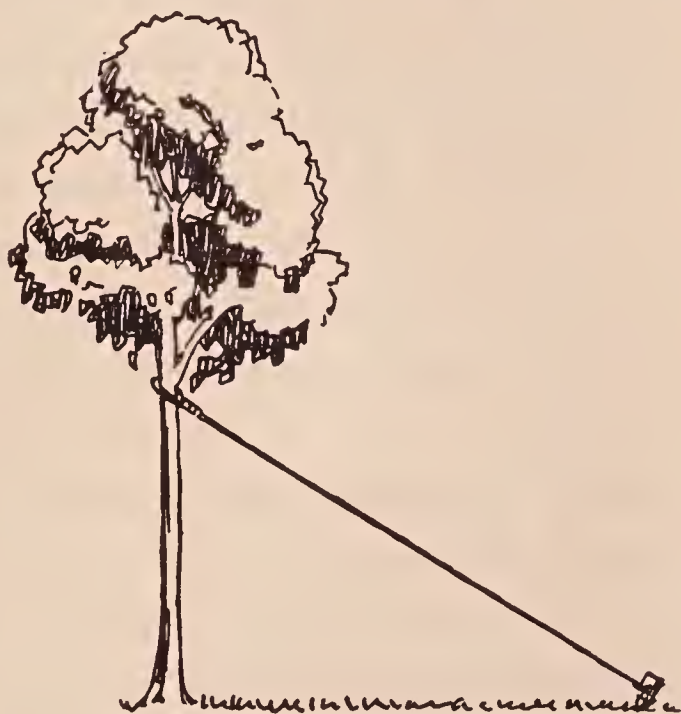


FIG. 12.—How it was helped to grow straight

standing. These are all ways of giving the body a bad shape into which it later may grow.\*

**How Crooked Trees Are Made to Grow Straight.**  
—The law of growth may work for our good as well as

\* No special harm will come from taking some bad position for a minute or two and then straightening up, as people do in resting. It is when the bad positions are kept for fifteen minutes or half an hour at a time and taken many times during the day that the natural shape of the body is injured.

for our harm. This can also be shown by the growth of trees. For example, a man knowing about the habits of trees planted a young elm in his front yard for shade. It was a healthy little tree, but had one bad fault. It was badly bent over (Fig. 11). To cure this fault, the man tied a rope to the top of the tree and pulled it up straight. He then tied the other end of the rope to a stake (Fig. 12) and left it that way for the rest of the summer.

During all this time it had to grow straight instead of crooked. When the rope was finally taken off, it remained straight. *It had grown straight from having been held straight.* This should be an encouraging lesson for those who have got out of shape in their growing.

**How Crooked Children Can Grow Straight.—**When children are very badly out of shape, they are put under the care of doctors, who treat them much as the crooked tree was treated. The doctors put them in plaster casts or so bandage them that they are held in the right shape until the body can hold this shape itself. This is usually a long time — weeks and even months — and it is not pleasant to be so treated. But those needing such treatment do not object, for it is worth everything to get back into the right shape. However, for children who are only slightly out of shape, this treatment is unnecessary. Such children can, with a little effort, do for themselves all that need be done in order to grow back into a fine shape.

**The Main Rule to Follow.**—The small tree was simply held straight until it grew that way. If the child who is slightly out of shape will only hold himself in the right shape for a good part of each day, he, too, will soon be growing up straight. The main rule to follow is this: *Whenever you think of it, put yourself in the best shape possible and hold this shape as long as you can.* Practice this rule in standing, in sitting, and in walking about. It is also a good plan to ask your parents and friends to remind you when you are in a bad position so that you can work harder to get back into good shape.

**How One Already out of Shape May Find the Correct Standing Position.**—While the person who is naturally in good shape will take the correct position by standing tall, one who is out of his natural shape has a harder task. A good thing for him to do is to start with his feet. First, place the feet side by side with the toes pointing straight ahead. Second, push the hips back and draw in the abdomen.\* Third, push up the chest and lower the chin, keeping the mouth closed. Fourth, push the top of the head as high as possible, standing tall. Fifth, relax all the muscles as far as this can be done, still keeping all these positions.

Practice getting into good shape in this way until you can do it easily and quickly. A boy standing in correct shape will appear as in Figure 13. You need

\* The abdomen is the soft part of the body below the ribs. Its walls help greatly in holding the stomach and the intestines in place.



not pay any attention to the shoulders; these will be correctly placed when the other positions are taken.

**To Find the Correct Position in Sitting.**—When taking the correct position in sitting, we may also start with the feet. These should be side by side and on the floor. The hips should be pushed back and the abdomen drawn in. The chest should be pushed up, the chin drawn down, and the head held high. One may or may not lean against the back of the chair. If he has to bend forward, he should bend at the hips and not in the middle of the back.



FIG. 13.—This boy stands correctly.

**Aids in Keeping the Right Shape.**—To grow into the right shape, we must keep this shape most of the time. To do this is our hardest problem. There are so many things to make us forget, and it is hardly natural to keep one's mind always upon himself. Fortunately there are some splendid aids to keeping in good position, which can be used constantly. These include the following:

1. Properly made and fitted shoes. Shoes with low, broad heels and broad toes help to keep us in correct positions in standing and are a real help in

growing straight. Uncomfortable shoes of all kinds cause us to take bad positions in standing, in order to protect the feet. Heels that are high and narrow are very bad for the shape.

2. Hygienic school seats and chairs. These are seats and chairs so built that one can sit comfortably in them in a correct position (Fig. 14). They are a great help in keeping the right position while sitting.

3. Properly fitted glasses for those who need them. Children who have to bend over in order to see print are forced to take bad positions in studying and in doing any kind of close work. Properly fitted glasses, by correcting this trouble, greatly aid one in keeping straight.

4. Good back muscles. If the muscles of the back are weak, it is almost impossible to sit and stand straight even when we try hard to do so. To have success in growing up straight, we must have strong back muscles. The next chapter will tell us how exercise helps to make these muscles strong.

5. Good postural habits. These are the habits that cause us to take correct positions in standing and in sitting when we are not thinking about them. Such habits should be formed early in life. Habits

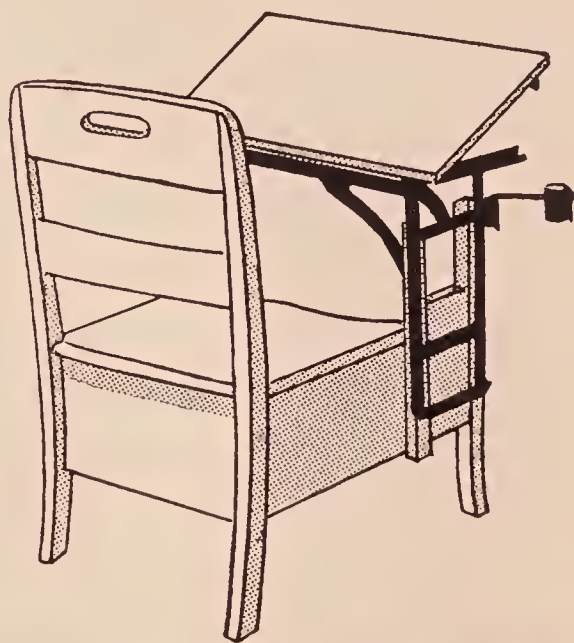


FIG. 14.—One kind of hygienic school seat and desk

that cause us to take bad positions should, of course, be broken.

**Facts Learned.**—(1) Although most children start upon their journey of growth in the good shape that Nature intended, many of them get out of shape before the journey is completed. (2) In order to grow up straight, we must train ourselves to sit straight, stand straight, and to keep straight when we are walking about. (3) If we do this, only some bad accident or serious illness can keep us from being in the right shape when we have finished growing. (4) If one has lost his good shape, he must work hard to win it back. (5) After this he must keep the right shape until his journey of growth is finished.

#### QUESTIONS

1. Name four good reasons for keeping the body in the right shape, especially while one is growing.
2. What lesson may we learn from trees about growing up straight?
3. What is the main cause for one's growing into a bad shape? How is this cause avoided?
4. What must a child who is still straight do in order to keep on growing straight?
5. What must the child who is somewhat out of shape do to grow straight from now on?
6. How may one who is somewhat out of shape take the correct shape in standing? In sitting?
7. How is improving one's shape like straightening a crooked tree? How does it differ?
8. How do good eyes help us to keep a good shape? How do comfortable shoes help?



## CHAPTER VI

### TO MAKE GROWTH THAT IS SOLID AND FIRM

Have you ever noticed the difference in people's bodies? Some are solid and firm to the touch. Others feel soft and weak. There seems to be as much difference in people as there is in the wood of different kinds of trees.

**Another Lesson from Trees.**—Going through the forest when the weather is fine, we see little differences between the trees that have hard wood and those that have soft wood. Both kinds look pretty with their spreading branches and green leaves. Both make a cool shade in which it is pleasant to linger on a hot summer's day. But let us go through the forest after a storm! The oak trees, the hickory trees, and the other trees with the hard, firm wood look almost as they did on the bright days, and only here and there do we find a branch or twig that has been broken. This is not true of the softwood trees. The soft maples, the box elders, and the other softwood trees all have branches that are broken or twisted, and great numbers of leaves and twigs are lying on the ground (Fig. 15). Trees with soft wood cannot stand the storms so well as trees whose wood is solid and firm.

**Weak People Cannot Stand the Strains of Life.**  
—Persons with soft and weak bodies can live and enjoy themselves as long as everything is pleasant and easy, but they cannot stand so well the strains of life. Like the softwood trees, they are easily injured.



FIG. 15.—Softwood trees fare badly in a storm.

They cannot stand hard work (Fig. 16). They cannot stand getting wet or chilled. They cannot stand grief and disappointment and the strain that comes from great excitement. Even a slight accident may cause them much harm. Then when they are injured or sick, they suffer more and recover more slowly than those whose bodies are solid and firm.



Whether we are to be like hardwood trees or soft-wood trees when we are men and women, depends very much upon the way in which we grow as boys and girls. We should make solid and firm growth from day to day.

**Solid Growth and Exercise.**—Solid and firm growth depends upon many things, but most of all upon the amount of exercise that one takes. Suppose we feel the arms of several children of different ages. We shall find that most of those who take enough exercise have well-formed and solid arms. Those who take little exercise have arms that are soft and weak. What is true of the arms is true of the entire body. Exercise helps us more than anything else to become solid and firm. Not to take exercise is the surest way of becoming soft and weak. There are several reasons why this is true.

**What Exercise Does for the Muscles.**—Exercise has its greatest effect upon the muscles. Muscles that are exercised become larger and stronger. Those that are not exercised soon become soft and weak.



FIG. 16.—The strain of hard work—something that soft-bodied people cannot stand



When we remember that almost half of the body is made up of muscles (Fig. 17), we can see what a dif-

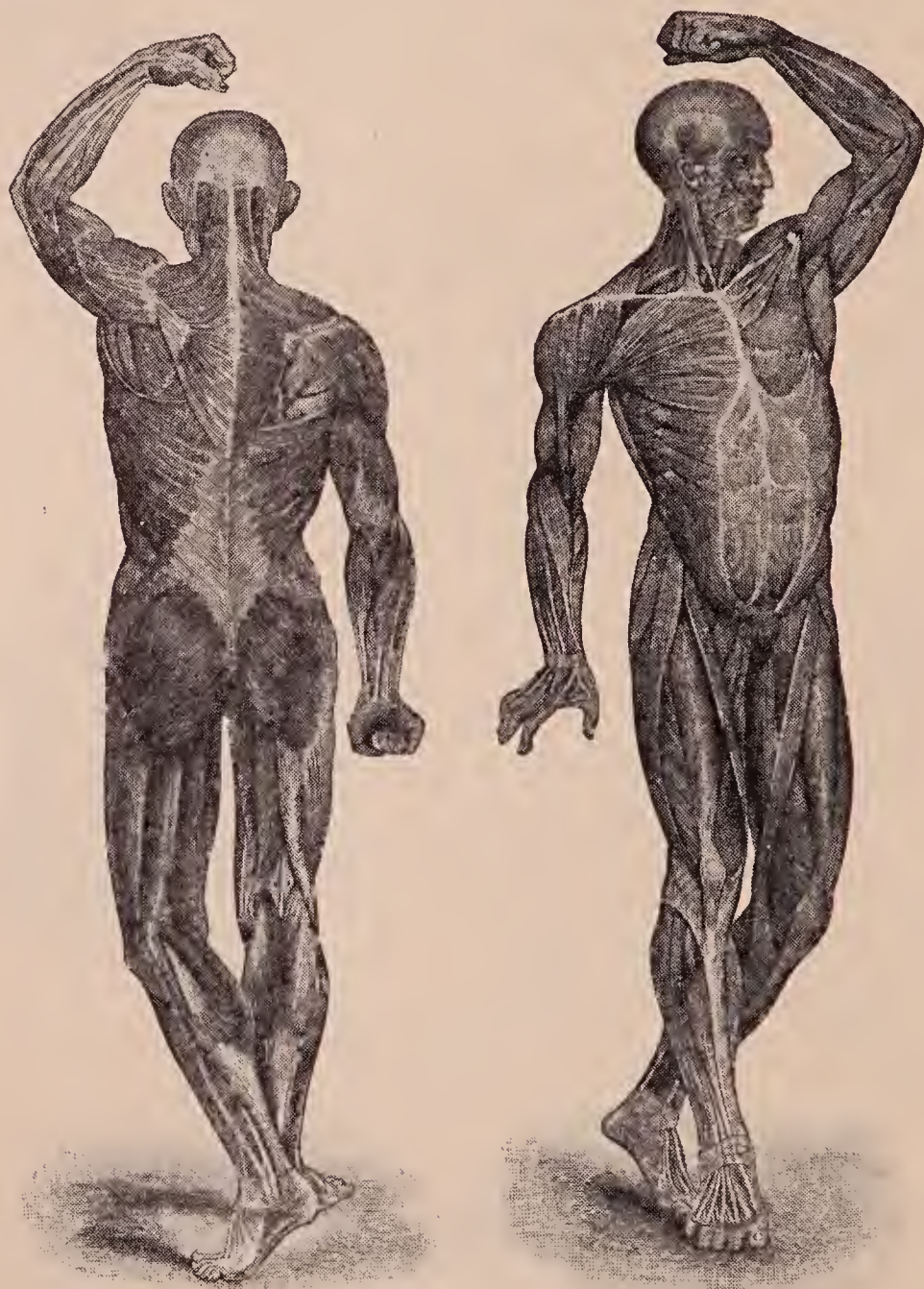


FIG. 17.—The muscular system

ference exercise makes with the whole body. Having strong muscles makes us strong all over and keeps us from getting tired so quickly when we work or

when we play. But we must not think that it is only the muscles that are improved by exercise. All the cells of the body are improved in one way or another. Especially does exercise improve certain cells found in the brain and spinal cord and in the nerves connected with these parts.

**Exercise and the Nervous System.**—The nerves control the muscles. To make the muscles act, the nerves carry messages to them much like currents of electricity. These messages are called *impulses*, and most of the impulses are from the brain and the spinal cord. To produce impulses and send them to the muscles is exercise for cells that form the brain and spinal cord and the nerves. From such exercise the nerve cells become stronger. Exercise also strengthens our nerve cells by making us sleep better.

**Exercise and Sleep.**—Have you ever noticed how sleepy you have felt at night after a day of exercise—perhaps on Saturday or during a vacation? You have had hard work to keep your eyes open until you could get into bed, and have slept so soundly through the night that it was hard to wake up in the morning. But to sleep as soundly as we should, we need only enough exercise to make us tired when night comes. More than this is apt to make us restless, so that we do not sleep as well as we should.

Children need plenty of sleep—considerably more than adults. Many of them do not get so much sleep as they need, even when they spend the right number



of hours in bed. They are not sleepy. This is a sign that they need more exercise during the day.

**Value of Strong Nerves.**—With strong and healthy nerves, we are not easily frightened, and we can take better care of ourselves in times of danger. Hard work hurts us less, and we can stand better the strains of life. We are better-natured and happier than we are when our nerves are weak. When we admire and wish for strong nerves and good courage, we must not forget what exercise can do in helping us to obtain them.

**Exercise and the Appetite.**—To make solid and firm growth, we must eat enough food of the right kind. Many children do not eat all they need because they do not have the appetite. They may even dislike the taste of foods which are good for growth, such as milk and oatmeal. Exercise is the greatest of all the aids to the appetite. Children who get enough exercise and who do not eat between meals will have a good appetite when mealtime comes. They will eat more for their size than grown people and will enjoy the foods that are good for growth.

**Exercise and the Digestion.**—Not only do people who take little exercise have little appetite, but they often have trouble in digesting what they eat. Those who take enough exercise have, as a rule, good digestion. Exercise seems to increase the saliva and other juices that digest the food and to strengthen the muscles of the stomach and intestines and those in the walls of the abdomen. It is a great aid to diges-



tion to have all these muscles strong, and special exercises are sometimes taken in order to build them up (Fig. 18).

**Exercise Aids in Throwing Off Waste.**—You have noticed how running and other kinds of hard exercise make you sweat. Sweating brings out waste through the skin. Exercise also makes one breathe faster and deeper. This causes more oxygen to be taken from the air and more waste to be thrown off

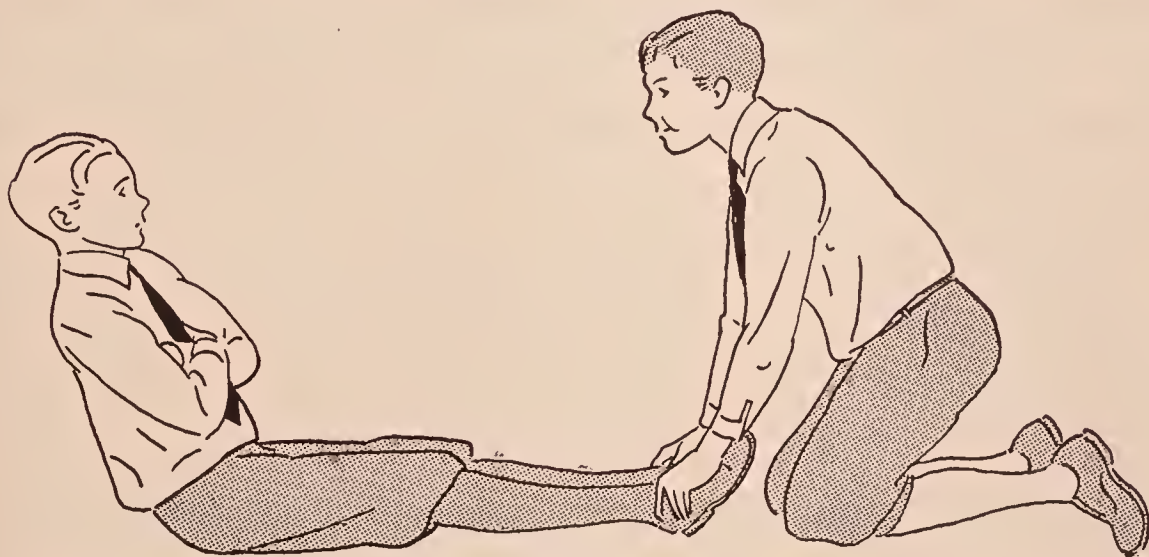


FIG. 18.—A special exercise for the abdominal muscles

through the lungs. On account of the good effect upon breathing, growing boys and girls should run a little every day.

**Exercise and Good Shape.**—Besides giving us bodies that are solid and firm, exercise is our best aid in growing up straight, as we have already learned. To hold ourselves in good shape, we need strong muscles, especially in the back and neck and over the abdomen. Exercise makes these muscles strong and also makes our nerves strong for controlling them.

This effect of exercise is greatly helped when we remember to keep in good shape on the playground—good shape in moving about as well as in standing and sitting.

**When Exercise Is Harmful.**—One can get too much exercise, as you may have found out for yourself. Overexercise lowers our weight and may even check our growth. It is just as harmful as too little exercise. What we need is the right amount of it. We should exercise enough each day to feel tired when night comes. But if we feel exhausted before night comes, we should stop and rest for a while or quit entirely for the day.

Besides having the right amount of exercise, we should avoid any kind of exercise that may lead to a bad accident. Hanging on moving trucks, jumping from trains or automobiles, and swimming in deep water before one is an expert swimmer are some of the kinds of exercise that children should avoid. The number of children, especially boys, who are injured or killed each year by accidents for which they are to blame is indeed very great.

**Games for Exercise.**—The games which children are so fond of playing often give just the kind of exercise needed. Every healthy child should learn all the school games that are suitable for his age and size, and then he should play them with the other children. The fun which one has from the game makes it all the better for the health. But games should never be played in such a manner as to get some one hurt.

This means, for one thing, that the playground be kept in good condition. All the loose sticks and stones should be removed, and all the rough places smoothed down before the games are started.

**Work as Exercise.**—We may think, at first, that work for exercise is not so much fun as games for exercise. But work, after all, is a kind of game. We can play the work game alone, or we can play it with others, and it is always fun when we are interested in what we are doing. Then work is such a wonderful kind of exercise. It is exercise for a purpose, and the purpose is often so important that we forget that we are really exercising. Nevertheless exercise from physical work does us good just as exercise from playing games does. It strengthens the body at the same time that it is accomplishing something that needs to be done. If you have not already learned how to work at things about the home, you should begin this part of your education at once.

**Other Aids to Firmness and Solidity.**—There are several other aids in growing solid and firm, but only two of them need to be studied at this time. These are foods of the right kind and life outdoors. Both are very important to growth and health in general. We shall read about them in the next two chapters.

**Facts Learned.**—(1) There is a great difference in the bodies of people; this shows in the way they are able to stand different kinds of trouble and strain. (2) The strong and the sturdy can stand the severest



trials; those who are soft and weak are easily injured. (3) Our greatest aid in developing strong bodies is physical exercise. This builds up the muscles, strengthens the nerves, improves the appetite, aids the digestion, and helps in throwing off waste from the body.

### QUESTIONS

1. Why is it better to have a solid and firm body rather than one that is soft and weak?

2. In what ways are weak-bodied people like the soft-wood trees? In what ways are they different?

3. Describe the effect of exercise upon the muscles.

4. In what two ways does exercise improve the nerves?

5. Tell of an experience in which exercise caused you to sleep soundly. One in which it increased your appetite.

6. In what ways does exercise aid in throwing off waste?

7. What kinds of exercise should be avoided?

8. Why should children learn to work as well as to play games?

9. If your body is as strong and firm as it should be, how will you keep it so? If it is not so strong as it should be, how will you improve it?

## CHAPTER VII

### FOOD AND GROWTH

Children like to eat, and it is well that they do. Eating is Nature's way of supplying our bodies with the materials needed for life and growth. Because they are growing, children require more food for their size than adults do.

**Where Our Foods Come From.**—Most of our food comes from the bodies of plants and animals, as you already know (Fig. 19). But where do you suppose plants and animals obtain what they give to us? To find the beginnings of our foods, we must go to the soil, air, sunlight, and water that are all about us. Through their roots, plants suck water and things that are dissolved in it from the soil. With their leaves they breathe a gas-like food, called carbon dioxide, from the air. By the aid of the sunlight shining upon their leaves they make, from the things taken from the air and the soil, the foods which they need for living and growing. But what plants make for themselves the animals can also use. By eating their leaves, seeds, stems, and roots the animals take the foods prepared by the plants and use them for their own ends and purposes.

Thus, through plants alone or through animals and

then through plants, our foods can all be traced back to the air, soil, water, and sunshine around us. Can you prove the truth of this by tracing some of your common foods, as bread, milk, and potatoes, back to their beginning?

**What Our Foods Do for Us.**—With the exception of oxygen, which we obtain from the air, our foods

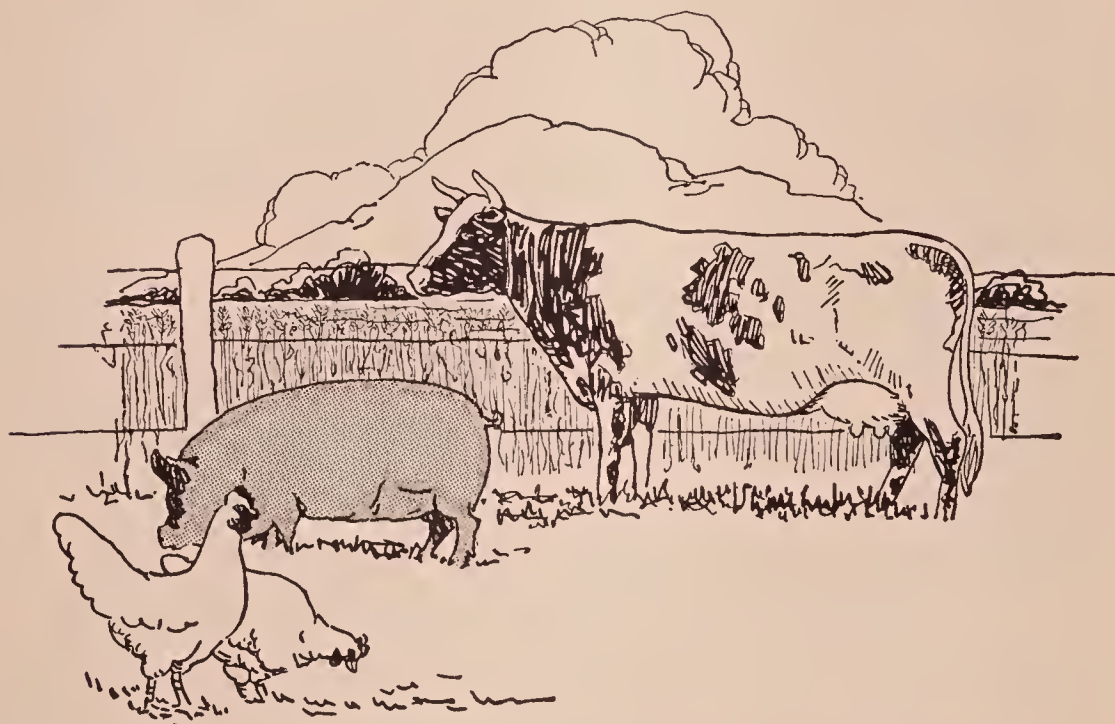


FIG. 19.—Some of Nature's food factories

supply the body with everything we need for living and growing. They supply materials for building up our cells. They supply materials which give us heat and power, just as gasoline gives heat and power to cars. They supply liquids for dissolving the other foods and carrying them to the cells and for dissolving and carrying away our waste. And they supply several kinds of materials that serve as aids for the different things the body must do. To serve all these



purposes, we must have many different kinds of foods.

**Building Foods.**—There are certain foods that are used in forming new cells and in replacing worn out materials in old cells. These foods are called *proteins*, and they are of several kinds. They are found in large amounts in lean meat, in eggs, in milk and cheese, in beans and peas, and in all kinds of nuts. Foods rich in proteins, such as those named, are called *building foods*. For growing and for keeping our cells built up, we should have a good serving of some kind of building food at each meal.

**Energy Foods.**—Energy foods are foods that do not become a regular part of cells, as do proteins, but which unite with oxygen, or “burn,” in the cells to give us heat and power. One kind of energy food is *fat*, and we find this in its best form in butter. Another kind of energy food is *sugar*, which you know from its sweet taste. And a third kind of energy food is *starch*, which is the white substance found in potatoes, rice, corn, wheat, and other grains. We need about three times as much of energy food as we need of food for building up our cells.

**Water.**—Water is the liquid used by the body in forming its own liquids, such as blood, saliva, and sweat. It is found within and between all our cells and forms, altogether, about two-thirds of the weight of the body. It is an aid in nearly everything the body does. Since we are constantly losing water through the skin, kidneys, and lungs, we must fre-

quently take it into the body by drinking. Plenty of water is good for the health.

**Mineral Salts.**—Mineral salts are the ashy substances that are left behind when foods are burned outside the body. They are body-helpers in a number of ways. They give us lime for our bones and iron for our blood. They make our foods more palatable, are good for our muscles, and serve other purposes. While they are present more or less in all our foods, they are present in largest amounts in fruits and vegetables.

Our common, or table, salt is the mineral salt every one knows most about. Since our foods do not contain as much of this salt as our bodies need, it is used in cooking and is served regularly at meals.

**Vitamins.**—Vitamins are the foods that occur in the smallest amounts of any of our foods. This, however, does not keep them from being very important. They protect us from different kinds of disease and are useful in other ways. Five different kinds of vitamins have been discovered, all of which are necessary in different ways to life and growth. Our meals should be so planned that we get a constant supply of the different kinds of vitamins. Foods rich in vitamins are milk, butter, eggs, whole wheat, yeast, oranges, tomatoes, and lettuce and other foods that contain the leafy parts of plants. Cod-liver oil, though not thought of as a food, is very rich in vitamins.

**What Children Should Eat.**—Excepting babies, whose main food is milk, children may eat the same

foods as their parents provided the parents eat what is best for people in general. Old and young alike must have sufficient amounts and varieties of building foods, energy foods, mineral salts, and vitamins. But on account of the growth which children must make, there are certain foods that are especially good for them. The most important single food for them is milk.

**Milk for Growth.**—Milk is Nature's preparation for giving the young animal all the things needed for its early growth. It is the best of all our foods for children (Fig. 20). It contains protein for all the cells, lime for the bones, sugar and fat for heat and power, and vitamins for health in general. Milk, more than any other single food, causes rapid and healthy growth. Every child should have at least one pint of pure, whole milk each day, and some can use more to good advantage. The milk habit should be cultivated.



FIG. 20.—Pure milk—the best food for growth

**Fruit Juice and Tomato Juice for Children.**—It is sometimes necessary to heat milk in order to kill germs that it may contain. In most of our large cities this is done regularly and on a large scale. This is for the protection of those who drink it. Heating the



milk, however, has one bad effect. It destroys one of its vitamins—the one called vitamin C. But it happens that tomato juice, orange juice, lemon juice, and fruit juices generally, are rich in this particular vitamin. By eating at one meal each day a tomato, an orange, an apple, or some other fruit, we make up for what is lacking in the milk. Even when the milk has not been heated, doing this is considered a good thing for the health.

**Liver as Food.**—Liver obtained from either the beef or the calf is another food that supplies what may be lacking in milk, especially for certain children. Young rats fed on milk alone stop growing, but if liver is added to their diet, they start growing again. Besides aiding in the growth, liver is also one of our best blood-builders. Children who are pale in color from a lack of red cells in their blood have been greatly helped by well-cooked liver served two or three times a week.

**Cod-Liver Oil.**—Although sold as a medicine, cod-liver oil is really a food. It is one of the richest of known foods in two valuable vitamins—vitamins A and D. Both of these vitamins are needed for growth, vitamin D being necessary for good growth of the bones. But while vitamin A is abundant in milk, butter, and a number of other foods, vitamin D is found in only small amounts in any of our foods. Even milk contains but little of it. Cod-liver oil, therefore, is our very best food for this vitamin. Doctors know about this, and many of them recom-

mend a teaspoonful of cod-liver oil a day for each child during the winter months. The reason for giving it only during the winter months is explained in the next chapter.

**Protective Foods.**—There is no single food that contains everything the body needs in just the right amounts. Many foods, like sugar, are lacking in several respects. A protective food is one that protects the body in case one fails to get all the kinds of foods he needs. It protects the body by supplying what is lacking in the foods that are used. Milk, liver, fruit juices, and cod-liver oil are all protective foods. Other protective foods of great importance are the leafy parts of plants, such as “greens,” lettuce, spinach, cabbage, and kale.

Growing children need at all times protective foods of different kinds. Some of them should be on the table at each meal.

**Drink Plenty of Water.**—Although water is the most abundant of all our foods, very few people drink as much of it as they should. Growing children need plenty of water, and they may drink it during meals as well as between meals. At meals, however, it should be taken in sips and not used to wash down unchewed portions of food. One of the best times for drinking a full glass of water is in the morning before breakfast.

**Children and Candy.**—On account of the sweet taste of candy children often fall into ways of using it that are harmful. Although candy is a food, giving

us heat and power, it is a very incomplete food. It has no protein for rebuilding the cells and no mineral salts or vitamins. It also dulls the appetite for other and more important foods, and if eaten very much between meals, it causes indigestion and decay of the teeth. On account of its harmful effects, some parents object to the use of even the smallest amounts of candy by their children.

Other parents permit their children to use some candy, but insist that it be eaten during or just following the regular meal. The last-named plan is perhaps the best.

**To Keep up the Appetite.**—A good appetite is not only a help in getting enough food, but it aids also in the selection of food and makes eating more enjoyable. In doing these things it aids in digestion. By managing properly one can have a good appetite at each meal. The way to manage the appetite is as follows:

1. Take sufficient exercise each day. Exercise improves the appetite.
2. Avoid eating between meals. This will save the appetite for the regular meals.
3. Do not overeat. If we overeat at one meal, the extra food that we have eaten will keep us from getting hungry in time for the next meal.

**Cheerfulness at Mealtime.**—We eat more and digest better what we eat, when we enjoy our meals and are good-natured and cheerful (Fig. 21). This is because of the effect which the mind has upon the



muscles and glands of digestion. Cheerfulness at mealtime plays an important part in the happy growth journey already mentioned. But in addition to helping the one who is happy, it helps those with whom he eats, adding something to the general atmosphere of good feeling needed at every meal.

**Facts Learned.**—(1) Nothing is more important for health and growth than foods of the right kind in sufficient amounts. (2) We must have building

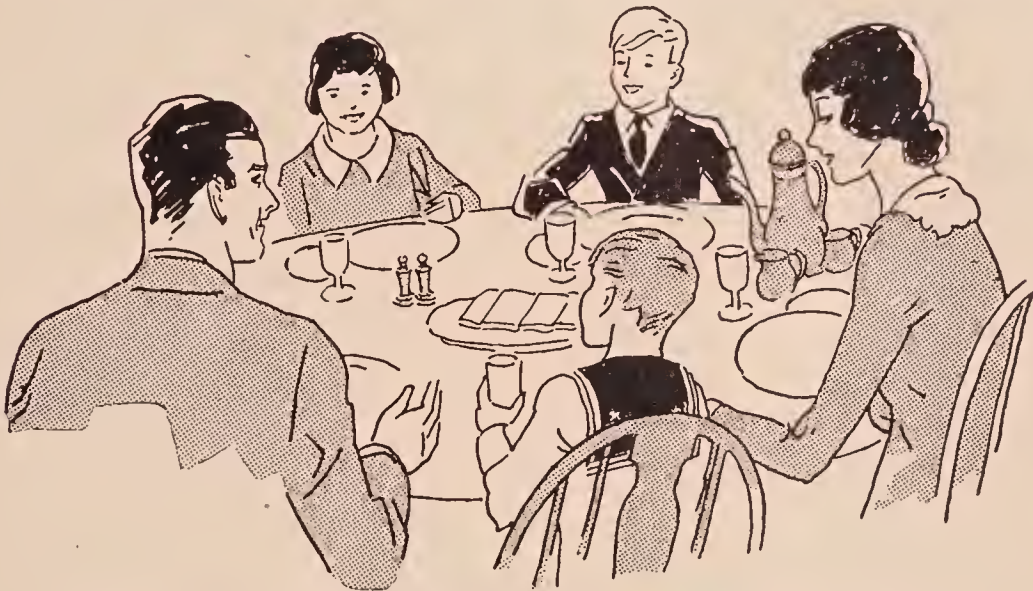


FIG. 21.—A time when all should be cheerful

foods, energy foods, water, and several kinds of mineral salts and vitamins. (3) On account of their growth children require more food for their size than adults do. (4) For the same reason children should eat generously of protective foods every day.

### QUESTIONS

1. How do plants and animals differ with respect to their food? From what sources are most of our foods obtained?

2. What different things do our foods do for us?

3. Of what value is milk as a food? How much milk should each child have per day?

4. Why should a child have a tomato or some kind of fruit at each meal?

5. Tom does not like milk and refuses to drink it. Is Tom right or wrong in his refusal? Why?

6. Why do the doctors frequently advise the use of cod-liver oil for children?

7. In what ways may harm result from the use of candy? How may its harmful effects be avoided?

8. What are protective foods? Name several examples.

9. What are the advantages of having a good appetite at each meal? How is this to be obtained?

## CHAPTER VIII

### SUNLIGHT AND OUTDOOR AIR

Our journey of growth, like other journeys, should take us into the great outdoors. Direct sunlight and the fresh outdoor air are both necessary to health and growth.

**Sunlight's Trip to the Earth.**—You will all agree that ninety-three and one-half millions of miles is a very great distance. An airplane traveling at the rate of two hundred miles per hour would require more than fifty years to go that far. Yet this is the average distance that sunlight must travel in order to reach our earth from the sun. And strange to say, it makes the entire trip in a little over eight minutes. But this is no more wonderful than what the sunlight does after it arrives.

**What Sunlight Does for the Earth.**—Upon reaching the earth, most of the sunlight is changed into heat, and this warms the air, the soil, and the large bodies of water. By warming the air more at one place than at another, it causes great movements in the air, called winds, and these winds carry moisture, as it evaporates from the oceans, out over the land. As the warm air cools, the moisture condenses into drops of water and falls as rain to wet and soften the



soil. Then the light falling upon the leaves of plants enables them to make the food needed for themselves and also the food needed for animals, as explained in the last chapter. In warming the air, soil, and bodies of water, in causing the winds to blow and the rain to fall, in helping plants to build up foods, and in other ways, sunlight is the cause of all life and growth. Without it our earth would be a cold and dead world.

**Sunlight and the Growth of Plants.**—Sunlight not only causes plants to make their food, but it also helps them to use their food to good advantage. Tiny plants growing from seeds and sprouts growing from roots where the food is already prepared grow best in the sunlight. If a sprouting potato is kept in the dark, the sprouts grow very long and slender and make tiny leaves with almost no color in them. But if the sprouting potato is kept in the sunlight, the sprouts are short and thick, and the leaves that form are large and green. This kind of growth is much healthier than that made in the dark.

**Sunlight and the Growth of Animals.**—It was formerly thought that because animals do not make their own food, they do not require direct sunlight for their growth. It is now known that while they can grow without the direct light from the sun, they grow much better with it. The pictures on the next page (Figs. 22 and 23) show two coops of chickens of the same age that had been fed the same amounts of the same kinds of foods. One coop received the direct light from the sun. The other coop was kept indoors



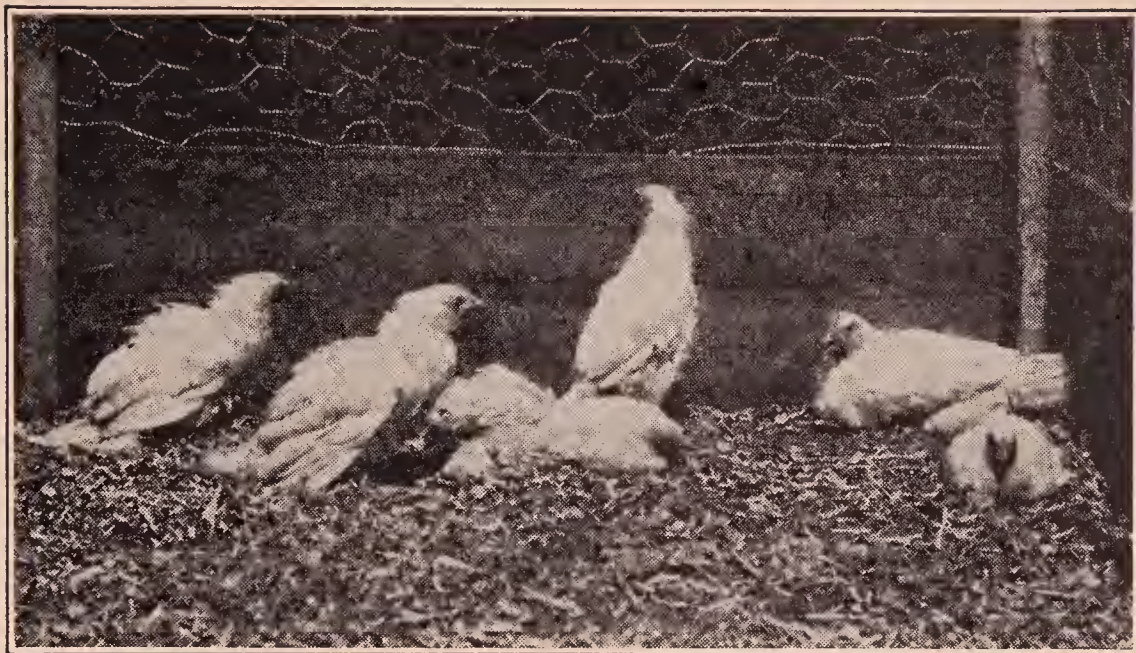


FIG. 22.—These chickens were well fed and cared for, but failed to get direct light from the sun.

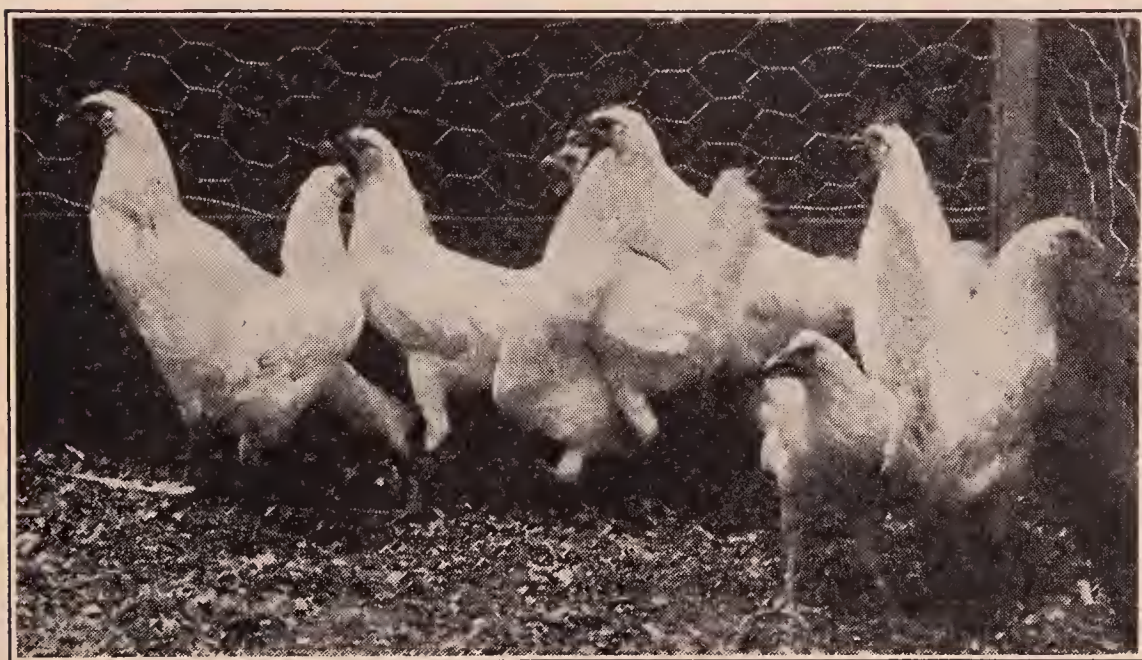


FIG. 23.—These chickens got light directly from the sun.

*Courtesy of J. S. Hughes and co-workers in the Kansas State Agricultural College.*



behind glass. The difference is not hard to see. Direct sunlight is a cause for healthy growth in chickens. The same results can be shown with other animals.

Growing animals which do not have enough sunlight are liable to have a disease called *rickets*. This affects the whole body more or less but is most injurious to the bones. The bones fail to harden as they should, the leg bones being unable in some cases to hold up the body. The chickens shown in Figure 22 are all suffering from a disease called "limber leg," which is the same as rickets in children.

**Sunlight and the Cure of Diseases.**—Chickens that have been kept from the sunlight until rickets has developed quickly recover from this disease when placed in the sun. Sunlight has also been successfully used in curing rickets in children. Another disease that has been successfully treated with sunlight is tuberculosis of the bones and the glands. In the treatment of both tuberculosis and rickets children at the beginning are exposed only for short periods and with the light striking only a small part of their bodies. As the skin begins to tan, more surface is exposed for a longer time. After a good coat of tan has developed, the entire body is exposed for long periods. We are just beginning to know what a wonderful thing pure sunlight is for health and growth.

**All the Sunlight Necessary.**—The rays of sunlight are of two kinds—visible light that we can see and invisible rays that we cannot see. The visible light gives the colors of the rainbow—red, orange, yel-



low, green, blue, and violet. These can all be shown by holding a prism in the direct light from the sun (Fig. 24). The row of beautiful colors thus formed is called the *spectrum*. While the invisible rays do not show in colors they act upon photographic plates and can be studied from the pictures which they form. There are several kinds of invisible rays, but the kind which concerns us most is called by scientists the *ultra-violet light*. It is the ultra-violet light that we most need for health and growth.

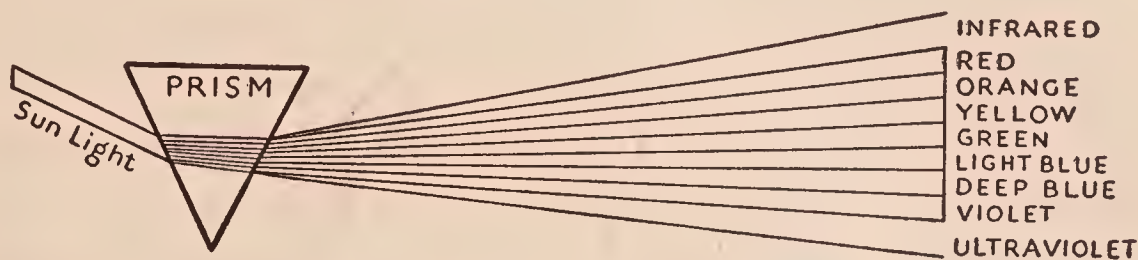


FIG. 24.—A prism separating sunlight into its visible and invisible rays.

Unfortunately the ultra-violet rays do not pass through ordinary window glass. This keeps us from getting their effects when we are indoors. Even in a well-lighted room these rays are almost entirely absent. To obtain them, we must have outdoor sunlight upon the bare skin (Fig. 25).

**Sunlight and Germs.**—Because ordinary window glass does not allow the ultra-violet light to pass through, we must not get the idea that well-lighted rooms are no better than poorly lighted ones. Sunlight can kill many kinds of germs that cause disease, and this is true of the light that comes through window panes as well as of the light outside the house.

On this account, we want plenty of light in all our rooms, especially during the winter months. But, while this is true, we should take advantage of every opportunity for going outdoors. There is another reason for getting out besides the difference in the light. It is the difference in the air.

**Outdoor Air.**—Even when we do our best to keep the indoor air in good condition by ventilation, it is

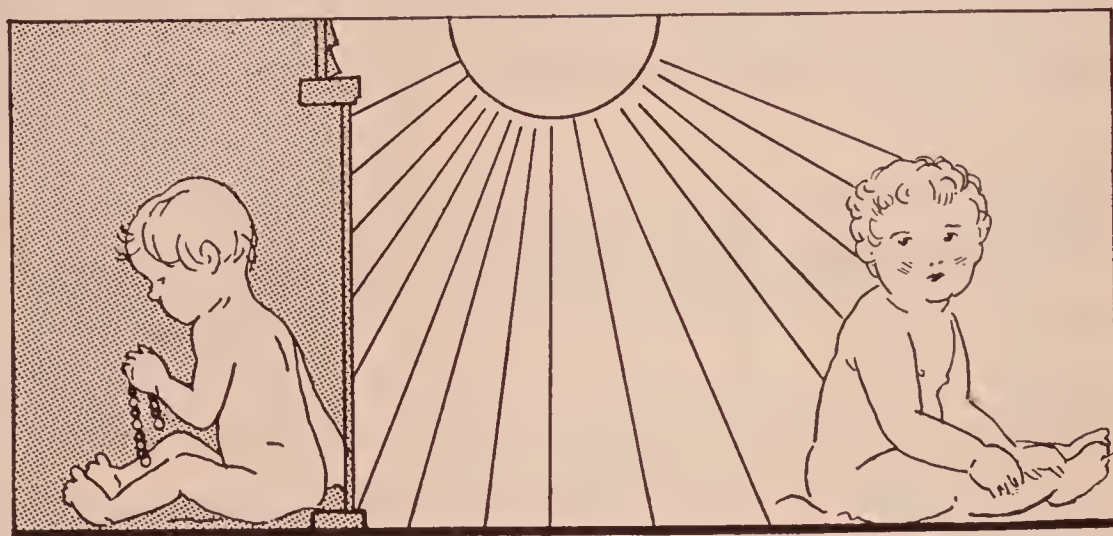


FIG. 25.—The baby on the right seems to be healthier than the other. Is there a reason?

seldom so good for the health as the air which is outdoors. The outdoor air is cooler, as a rule, than the indoor air and has more movement. On account of its coolness and its movement it causes the cells of our bodies to be more active. Outdoor air also has a good effect upon the linings of the nose, throat, and lungs. By keeping these healthy, we take cold much less easily.

**Why the Doctor Does not Prescribe Cod-Liver Oil for Children in Summer.**—Those exposed enough

of the time to direct sunlight are able to make in their bodies the most important of the vitamins contained in cod-liver oil; that is, vitamin D. The summer days are much longer, as you know, than the winter days, and the sunlight then is much more direct and powerful. Then it is generally warm and dry in the summer and much easier to be out every day. Consequently in summer there is no need of our taking cod-liver oil in order to obtain enough of vitamin D. We can make it in our own bodies for ourselves through the aid of our good friend, the sun.

**Precautions.**—From our study of this chapter we should resolve to observe faithfully one of the most important of the laws of health and growth. This is the law of outdoor living. *Everyone should spend as much time outdoors as possible.* In doing this, we have two important precautions to observe—one for winter and one for summer.

**The Winter Precaution.**—In winter keep the feet dry and avoid becoming badly chilled. Being chilled for a long time and going about with wet feet are both frequent causes for illness, especially colds. No harm comes to the healthy child, however, from being cold for a short time.

**The Summer Precaution.**—In summer protect the eyes from direct sunlight and avoid “sunburn” and the other injuries that result from direct exposure of the tender skin to the sun. At the beginning we should expose only small portions of the skin and we should do even this for only a short time each day.



Not until a good coat of tan is formed, should we try long exposures of large surfaces.

**Our Homes for Protection and Convenience.**—As we think about the importance of outdoor life, we must not forget that the houses in which we live are also important. They protect us from wet and cold and from living enemies that can do us harm. They supply places for keeping our clothing, food, cooking utensils, furniture, and the other things needed for everyday living. And they provide places for rest and privacy and for the care of those who are sick. All this is important for health and growth. The mistake is made when we spend too much time indoors and forget the wonderful things on the outside. We fare best when we get our outdoor life and indoor life in right proportions.

**Facts Learned.**—(1) Every child, and every grown person as well, should spend a considerable part of each day outdoors. (2) One purpose in doing this is to secure the healthful effects of direct sunlight upon the body. (3) Another purpose is to obtain the good effects of outdoor air. (4) Indoor life is also important, but in other ways.

### QUESTIONS

1. Name several interesting facts about sunlight.
2. Which is more important, sunlight or food? Give reason for answer.
3. In what two ways does sunlight aid in the growth of plants?

4. Give proofs that sunlight aids in the growth of animals.
5. What two diseases can be cured by direct sunlight? How are these diseases prevented?
6. Compare the sunlight as it shines through our windows with the direct sunlight outdoors.
7. Why is outdoor air better than indoor air?
8. What precautions should be observed in going outdoors in winter? In taking sun baths in summer?
9. James takes cold very easily and on this account stays much of the time indoors where it is warm. Is he right or wrong in this? Why?

## CHAPTER IX

### GROWTH AND SLEEP

Have you ever gone to bed at night so tired that you could hardly keep your eyes open while you were undressing? Then have you waked in the morning all rested and ready for another day of play and work? You have, of course; so you already know something of the wonderful things that sleep does for the body.

**The Wonders of Dreamland.**—Going to sleep is often much like visiting a new and wonderful country (Fig. 26), but not always the same country by any means. In fact, our dreams are seldom the same from time to time. Often we are in lands that are bright and beautiful—full of sunshine, birds, flowers, and fairy-like people who are very kind. But sometimes we find ourselves in cold and lonely places with dangerous rivers, wild animals, and people bent on doing us harm. When the scenes are bright and beautiful, we can sleep on and enjoy them. If things become too exciting, or we meet with some mishap, we can quickly escape by waking up.

Should we believe in dreams? Only to the extent that they tell us something of the condition of the body. When we are in good health, we have pleasant dreams or none at all. Bad dreams usually mean that



everything is not just as it should be. Anything strongly affecting the nerves, as getting frightened, or worrying, is a cause for bad dreams. Other causes are too much hard play after supper or eating some rich food, like mince pie, at this meal.

**What Sleep Does for Us.**—Sleep does three things for us which are of the greatest importance.



FIG. 26.—Dreamland

1. It rests the body. From our play and work during the day, waste matter is formed at the cells faster than the body can throw it off. It is formed in the brain, in the muscles, and in the nerves—in fact, all through the body. This gives us the tired feeling which we call *fatigue*. While we can free ourselves of waste by simply resting, we rid ourselves of it faster and more completely by sleeping. The kidneys, the lungs, and the skin all aid in throwing off this waste.

2. It aids the body in rebuilding. On account of our work and our play, we use up materials in the cells of the muscles, brain, and other parts of the body faster than they can be replaced. During sleep the entire body is almost completely quiet. This enables the cells everywhere to replace what they have lost during the day. In this way, as well as by resting us, sleep prepares the body for the next day's work and play.

3. It aids the young in growing. When we are moving about in work and in play, and even when we are sitting still, the body is using up the same kinds of materials that it needs for growth. When we are asleep, much of this is saved for growth. It is only by getting enough sleep that we can be sure the body is getting enough of the materials needed for its growth.

**Sleep and School Work.**—While sleep benefits all parts of the body, it benefits the brain and nervous system most of all. With a rested and refreshed brain and nervous system, we can do better school work and we can do it more easily. With enough sleep each night our school days will be more enjoyable and happy and also more successful than they could be if we were tired and cross from lack of sleep.

**Amount of Sleep Needed by Children.**—While children require more sleep than adults, all do not, of course, require the same amount. The older the child, the less he needs, until the eight-hour requirement of adult life is reached. A child from six to

nine years of age needs from ten to eleven hours of sleep out of every twenty-four; a child from nine to twelve needs from nine to ten hours. But during most of the time from fourteen to twenty the amount should be about nine hours on account of the rapid growth during this, the adolescent period.

Some young people, however, require more sleep than others of the same age. Delicate and nervous children require more sleep than those who are healthy, and those doing heavy work in school require more than those doing light work. To a large extent one must find out for himself how much sleep he needs.

### **How We Know When We Have Enough Sleep.**

—Do you wake up in the morning without being called? Do you feel rested and strong during the day? Do you enjoy your play? And are you able to keep wide-awake during the reciting of lessons? If your answer to these questions is "Yes," you are probably getting enough sleep; but if it is "No," Nature is probably warning you that you should go to bed earlier.

It is claimed by some that we can get too much sleep. While this claim is possibly true, it is something about which young people do not have to worry. Their problem is to get enough.

**How We Obtain Enough Sleep.**—We must, first of all, allow ourselves enough time for sleeping. We must go to bed early enough in the evening and get up late enough in the morning to have spent the required time in bed. For example, the child of six who should



have eleven hours of sleep per day must retire not later than seven-thirty in the evening if he is to rise at six-thirty in the morning. Of course one could go to bed later and rise later in the morning, but in this way he would not obtain so much of the valuable sunlight and the freshness of the early morning air.

After the proper hour has been decided upon, we must go to bed promptly when the hour comes. Then, too, we must be in the mood for sleep. The day with its work, its play—its hardships, perhaps—has come to a close, and we are tired and sleepy. For our own good we must go to sleep as soon as possible. So we take a comfortable position, close our eyes, and lie very still. Then almost before we realize it, we are asleep.

**Aids to Sound Sleep.**—Sound sleep, which is often dreamless, is much more refreshing than the sleep during which we are excited by bad dreams or wake up often. We have five valuable aids to sound sleep, as follows:

1. A suitable room in which to sleep. The sleeping room should be cool, quiet, dark, and well ventilated, but free from drafts.

2. A comfortable bed. The bed must be neither too warm nor too cold. The mattress should be upon good springs and sufficiently thick. And the pillow should be rather solid and just high enough when one lies on his side to support the head on a level with the rest of the body.

3. Enough exercise during the day to give a com-

fortable feeling of weariness on retiring. We sleep less soundly than we should both when we take too much and when we take too little exercise.

4. A quiet mind. We must forget our troubles and also our work when we go to bed, not thinking of anything if possible. Talking in bed keeps one awake by exciting the mind. Worrying when one does not fall asleep as quickly as he thinks he should has the same effect.

5. Sleeping alone. In sleeping alone we usually have more room, greater comfort, and less disturbance. These all help us get quiet and ready for sleep.

There is usually nothing to worry about when one does not fall asleep quickly after getting into bed or when one wakes up during the night. Many people who are light sleepers are perfectly healthy. One who is unable to sleep from any cause should take a comfortable position and lie quietly. This will rest the body and aid in its rebuilding, as well as help one get to sleep.

**The Midday Nap.**—Sleep during the day is usually unnecessary for healthy children over six years old. For those who are weak and tire easily and those who are recovering from some kind of illness, some daytime sleep is needed. The best time for this nap is just after the noonday meal, but one should not sleep too long—usually less than an hour. In schools and sanitariums for weak children the midday sleep is a part of the daily program for the upbuilding of health.

**Facts Learned.**—(1) Sleep rests and rebuilds the body and is one of our best aids to growth. (2) Because they are growing, young people require more sleep than adults do. (3) Weak and sickly children require more sleep than those who are strong and healthy, and the more active children require more than those less active. (4) Good health and good growth both depend upon our getting all the sleep we need.

### QUESTIONS

1. What three things does sleep do for us? Why do young people require more sleep than adults?

2. How does sleep aid in giving us a safe journey of growth? How does it help in making our growth journey successful?

3. John is seven years old and not so healthy as he should be. He goes to bed at ten and gets up at seven-thirty. What improvements in his sleeping hours would you suggest? Why?

4. How can one tell when he is getting enough sleep?

5. Name some aids to sound sleep.

6. What should one do when he fails to go to sleep quickly or to sleep as soundly as he thinks he should?

7. What children are benefited by a noonday sleep? Why should this usually be for a short period only?



## CHAPTER X

### GROWTH AND HABIT FORMATION

Although the forming of habits is not growth in the sense of becoming larger, it may be growth in the sense of increasing our powers. Unfortunately the forming of a habit does not always make us more capable and useful. It sometimes does the opposite.

**What Habits Are.**—A habit may be defined as the ability to do a certain thing or act in a certain way without having to think about it. Take, for example, a habit which all children should have—that of going to bed at an early hour. Suppose a child has never formed this habit, but stays up as late every night as his parents will allow. He or some one else must think about the time and decide when it is best for him to retire, and as we might guess, there is often a conflict of opinion. As a result he often fails to get to bed in time for his needed hours of sleep. On the other hand, if a child has the habit of going to bed at a certain hour, he retires when the time comes as a matter of course. He needs no urging from his parents for he has an inner urge—a habit—that is sufficient.

**What Our Habits Do for Us.**—Our habits help us to do things rapidly and with ease, saving our time and

energy. Especially do they save effort on the part of the mind. The mind, as you know, must learn many things and plan for life in general, besides directing the body in its work. By forming habits, the mind does not have to decide what is best to be done under each and every circumstance. This gives it time for other things. On this account, we may think of habits as *servants of the mind* to save it from unnecessary work. But just as there are servants who are dependable and servants who are not, we may have good habits and bad habits.

**When Habits Are Good and When Bad.**—Habits that aid us in our work of living and growing and in making our way in the world are good habits. Habits that injure health and check growth are bad habits. We must also count as bad habits any that hinder us in our work or that make it harder for us to keep on good terms with our neighbors. We can, as a matter of fact, form good and bad habits in connection with everything we do and in all our ways of acting.

**Good and Bad Social Habits.**—Social habits have to do with our treatment of others and our response to their treatment of us. They include our method of greeting people (Fig. 27), how we act when a favor is asked of us, and our manner of talking, laughing, and behaving in general. Good social habits cause people to respect us and like us. Bad social habits cause us to be disliked and sometimes to lose the respect of others. In order to live happily with people and to work and play with them successfully, we must

have good social habits. Such habits are also a great aid in our own advancement.

**Good Habits of Work.**—We should work when we work and play when we play, and habits that cause us to do this are good habits. Laughing and talking while we are trying to solve problems or learn lessons are bad habits because they will not let us keep our attention upon what we are trying to do, as you may have already learned. Other good habits of work are the habit of doing our best under all circumstances, the habit of finishing any worthwhile work that has been started, and the habit of leaving things in order after the work has been finished.



FIG. 27.—A happy greeting

**Habits of Honesty.**—Every child has to learn at some time the principle of honesty and to form the habit of putting it into daily practice. You have all seen babies and very small children pick up things that they liked and that were within reach. Some-



times a child may, without thought of wrong, take another's playthings or even steal money to spend for candy. He has not as yet formed habits of honesty. But it is quite a different matter when grown people or boys and girls in their teens have failed to form these habits. The penalty may be imprisonment, although there is another punishment which is just as bad: people lose confidence in us and cease to trust us.

Habits of honesty in the use of words are important, too. We have made real progress in character-building when we are able to make our words at all times express the actual facts.

**Habits for and Habits against Good Health.**—While social habits, work habits, and habits of honesty and dishonesty may all affect our health indirectly, there are other habits that affect our health in a direct and positive manner. Habits of eating and drinking, habits of retiring at night and of rising in the morning, habits of exercise and of cleanliness, and habits of using certain drugs all affect the health directly. Good habits for health are those that lead to bodily improvement and aid in keeping us well. Bad habits for health are those that do the opposite.

**How Habits Are Formed.**—The method of habit formation is that of repetition. By doing a certain thing over and over again we are able in time to do it without thinking about it. The repetition produces in time a condition in the brain and nerves that causes the act to be done without a special order from the mind. It is then a habit. All our habits are formed

in this way. It does not make any difference whether we are trying hard to form a good habit or are forming a bad habit without realizing it. It is the repetition that counts. So you see that we should be very sure before we start doing something over and over again that we are going to form a good habit and not a bad one.

**Our Habits as Part of Ourselves.**—Some people when they hear the ringing of the alarm clock which they set for themselves the night before, stretch and yawn and drop back to sleep. Others who would like to keep on sleeping, too, rise quickly and dress. You can see that these two kinds of people have formed different habits. In fact, people can be recognized by their habits somewhat as they are recognized by their features and the color of their hair. For this and other reasons our habits must be looked upon as a part of ourselves.

But our habits fortunately are not permanent parts of ourselves, as our hands and our eyes are. They are changing more or less all the time. All through life old habits can be broken and new habits formed.

**How Habits Are Broken.**—Habit breaking depends upon a very important fact. Our habits are temporary conditions. If we stop doing the thing that caused any one of our habits to be built up, the habit itself becomes weak and finally we no longer have it. To keep up our habits, we must keep on doing the things that caused them in the first place. To break them, we have simply to stop doing the

things that led to their formation. They will then disappear of themselves.

The work of habit breaking, however, will go on faster if we can build up a good habit at the same time that we are breaking a bad one. This is usually not hard, for nearly always when one is breaking a bad habit he has in mind a good habit to take its place.

**Drug Habits.**—Drug habits are more easily formed and more difficult to break than ordinary habits, and many of them cause great harm to the body. The more common of the drug habits are considered in the next chapter.

**Some Worth-While Habits.**—Already in our study we have found places where habits of the right kind would help greatly in supplying the things needed for good health and growth. Habits that all boys and girls should have include the following:

1. Habits of cleanliness and of keeping things in order about us.
2. Habits that cause us to sit and stand in good positions.
3. Habits of exercise and habits that cause us to spend a good part of each day outdoors.
4. Habits of eating only at mealtime and of eating the foods needed for health and growth.
5. The habit of retiring early at night and of rising promptly in the morning.

There is a reason also why we should form these and other good habits as soon as it is possible to do so.

**Youth the Time of Habit Formation.**—Although we can make and break habits as long as we live, the



time when habits are most easily made and broken is the time when we are growing. This is why youth is called *the formative period of life*. Young people, therefore, must be especially careful to form habits that are going to be their friends, rather than those which will be enemies. To think of it in another way, we must become masters of our habits instead of letting them master us.

**Facts Learned.**—(1) Good habits add to our bodily powers. (2) Bad habits lessen our powers and interfere with health and growth. (3) Habits are formed by repeating acts again and again. (4) They are broken by stopping entirely the acts that caused them in the first place. (5) Youth is the best time of all for forming the habits needed for a successful and happy life.

### QUESTIONS

1. Under what conditions is the formation of habits like bodily growth? When is it of an opposite nature?
2. Define a habit. How does it save work on the part of the mind?
3. When are habits good? When bad?
4. Name some good social habits. Some good habits of work.
5. What are health-giving habits? Name several. How are they obtained?
6. How should one proceed in order to break some bad habit?
7. Why is youth the best of all times for the formation of good habits?

## CHAPTER XI

### GROWTH AND HABIT-FORMING DRUGS

There are a number of substances called drugs, which, if used for a short time, cause habits that are very hard to break. While some of these do not concern us now, there are others that we should know about for our protection.

**How Drug Habits Differ from Other Habits.**—Ordinary habits, as we have already learned, are formed chiefly by repetition. But in the formation of drug habits, we have two causes at work. These are repetition and the effect of the drug itself. The drug causes an appetite, or craving, which becomes very strong when the one who has the habit of using a certain drug fails to obtain it. It is because of this appetite, or craving, that drug habits are more easily formed and are harder to break than habits are generally. Then the drug, besides causing an appetite for itself, is very apt to injure the body in other ways. On account of this injury, drug habits are frequently more harmful than other kinds of bad habits.

**The Need for Special Care by the Young.**—Because of their harmful effect upon the body, habit-forming drugs can easily interfere with our journey of growth. They can keep us from making a safe

journey, a successful journey, and a happy journey. Nor does the trouble stop with our growing. If we carry a drug habit through the formative period of life, we shall find it very hard to throw it off when we are grown. It will become a part of ourselves permanently—a part that always hinders and never helps in the work of living and making our way in the world.

Many of these habits start in ways that are innocent and without any intention of habit formation. People are caught by the drugs much as wild animals are caught in traps.

**How Bruin Junior Was Caught.**—Bruin Junior was a young black bear who lived in the Rocky Mountains. He was the son of Bruin Senior and Mrs. Bruin, both very intelligent bears who knew all about hiding from hunters and keeping out of their traps. This information they gave Junior as best they could. Especially had they warned him about a certain path leading to a spring where they all went at times for water. But Junior was fond of this path. It was so much easier to follow it to the spring than to go over rough stones and through thick bushes as did his parents. He had tried it several times, and nothing bad had ever happened.

But a hunter one day saw Junior's track in this path and at once set an ugly trap, concealing it with leaves and twigs. Junior stepped into this as he was making his usual trip to the spring. The trap caught one of his toes and held him tight (Fig. 28). Poor Junior! He had been caught while doing a perfectly



natural and innocent thing. But many other bears, and people as well, have been caught the same way.

Junior, however, did not lose his life from getting caught. Excited and angry, he began to fight desperately to free himself from the trap. He finally succeeded in breaking loose, but it was with great pain and by leaving one of his toes behind. He regretted the loss of his toe, and he was lame for months, but he

saved his life and learned a valuable lesson. He was even more fortunate than some of the people caught at times by habit-forming drugs.

One of the habit-forming drugs about which we hear much these days is alcohol. It is a treacherous drug and one capable of very great harm.



FIG. 28.—Bruin Junior is caught in a trap.

**The Alcohol Habit.**—The habit of using alcohol usually starts in a mild way by drinking beverages containing small amounts of alcohol, such as wine and beer. No harm seems to come from this at first, and one is easily led to drinking them in larger amounts as he has the opportunity. In time the appetite for alcohol is formed, and this appetite grows along with the habit formed by repetition. Unless the habit is broken, effects begin to show upon the health and the ability to work, and intoxication may at times occur.

If one now fails to see his danger and goes on drinking, the results may be the worst imaginable. The end in many cases is death.

But even before the habit is formed, alcohol is having other bad effects upon the body. These are considered in Book II of this course.

**Why the Sale of Alcohol Is Prohibited.**—We have, as you know, a national law which prohibits the making and selling of alcoholic drinks. While this law is a great protection to the man with an appetite for alcohol and also to his family, its greatest use has been of another kind. It has rid our country of thousands of alcohol traps for catching young men and boys in their teens. These traps are called saloons, and, before the days of prohibition, they were found in great numbers in all our cities and larger towns. The saloon traps were so effective in catching boys and young men that there was always a new army of drinkers to take the place of the old ones as they died off.

But while the saloon is gone, there are still other alcohol traps to catch people. One of the worst of these is frequently found in the home.

**The "Home Brew" Trap.**—Sugar, when it ferments, forms alcohol. Since the juice of grapes and of other fruits contains sugar, it will ferment quite readily. This fermented juice may contain from two to eight per cent of alcohol. These and other similar beverages containing alcohol are now made in many homes and, in some cases, for use by all members of



the family. Unfortunately some persons forget or do not know that the "home brew" drinks may be just as strong as the beer and wine used before prohibition and just as capable of doing harm.\*

**The Drug in Tobacco.**—The habit-forming drug found in tobacco is an oily substance called *nicotine*. It forms in the tobacco plant while it is growing and is found mainly in the leaves. It has a sharp taste, a strong, irritating smell, and is of the nature of a poison. It dissolves in the saliva when tobacco is chewed and appears in the smoke when tobacco is burned. From either the smoke or the saliva it can be absorbed into the blood. It acts strongly upon the nervous system, causing a habit which is very hard to break. In large amounts it injures the heart, eyes, and other parts of the body.

**Tobacco and Growth.**—There is considerable proof that tobacco, when it is used to any great extent

\* How wine and beer may affect the work of school children is shown by the following investigation. "A school director in Vienna observed that certain children were especially disobedient and unsatisfactory pupils. He noted finally that most of them came from homes where parents allowed them to have alcoholic drinks (wine or beer). With the help of his teachers he secured reports on the scholarship of 588 pupils. These he divided into four groups—those who never used alcoholic drinks, those who drank occasionally, those who drank once a day, and those who drank twice a day. He found that the best grades were made by those who used no alcoholic drinks at all and the poorest by those who drank twice a day. The more frequently the wine or other alcoholic liquors were used, the poorer was the school work." This investigation at least shows that weak alcoholic drinks, including "home brew" products, should not be served to children.



by the young, checks the growth. Doctors report that children working in tobacco factories are much stunted in their growth, and animals given nicotine in their food have stopped growing at their usual rate. Studies have also been made of the size and weight and the scholarship of boys in school who smoked, and the results compared with the records of the boys who did not smoke.

**Effect upon Schoolboys.**—"In a certain public school, twenty boys who smoked and twenty boys who did not smoke were studied for several months. The average age of the boys was fourteen years. It was found that ninety-five per cent of the boys who smoked were under size and weight for their age and were far behind in their studies. Of the twenty boys who did not smoke, only ten per cent were under size and weight for their age and behind in their studies." \* According to these studies, our journey of growth can be neither safe nor successful if we use tobacco to any great extent.

**Tobacco Traps.**—There are many tobacco traps for boys to fall into as they grow up. Everywhere the boy goes, he sees men smoking. He reads wonderful advertisements in magazines and upon billboards, praising the different brands of tobacco for the pipe, cigars, and cigarettes. He is fortunate, indeed, if he does not have to breathe a tobacco-scented atmosphere in his home. Boys have inquiring minds, and they like to experiment. If they fail to realize

\* *The Good Health Magazine*, February, 1922.

the dangers that lurk in these traps, they may try smoking for themselves. But if they smoke many times, the appetite for nicotine will begin to develop, and almost before they know it, they may have a rapidly forming habit. Most of the boys now smoking have been caught in this way.

**Why the Young Must Avoid Tobacco.**—While the tobacco habit does no one any good, there are special reasons why it should be avoided by young persons. Four good reasons besides the one already given are as follows:

1. Young people are more easily injured in every way than are mature people. If we take up smoking at all, it should not be until our bodies are as strong as growth can make them.

2. A habit started early in life and continued until maturity is much harder to break than one started later. The tobacco habit is hard enough to break when started at any age.

3. The tobacco habit grows upon one. As time goes on more and more tobacco must be used in order to satisfy the nicotine appetite. The later we start, the less time it has to grow.

4. The tobacco habit is an expensive habit. It is hardly fair to the man one later is to become to fasten upon him this needless burden. He may need all his money for something more worth while than tobacco.

**Pain-Killing Drugs and Their Trap.**—Morphine, cocaine, and several other drugs are used by doctors in

relieving pain. While they are serving this good purpose, some of them may do great harm because they are habit-forming and act very strongly upon the nervous system. Their power to relieve pain is for many people a very tempting trap. If they have headache, toothache, or pains in the stomach or joints, they are strongly tempted to take some pain-killing drug for relief. Many people have innocently fallen into the pain trap.

**The Aspirin Trap.**—Aspirin is used more than any other single drug for relieving pain. This is because it is supposed to cause no appetite, as do other pain-relieving drugs, and to be harmless in other respects. But aspirin is not a harmless drug. It weakens the heart and in large doses may even cause death. Even if it causes no appetite, as some doctors claim, the habit of taking it for every little pain could easily be formed by repetition alone. Please remember this if you are ever tempted by the aspirin trap.

**How We Avoid Pain Traps.**—The best way to avoid pain traps is to find other and better ways of managing ourselves. In the first place, we must live as healthfully as possible. Most of our pains are the result of some kind of poor health. In the second place, we must find and remove the causes of our pains as they occur. The purpose of pain, as you may know, is to warn us that something is wrong in the body. When we find what the trouble is and correct it, the pain stops of itself. In the third place, we should learn to endure pain when it is necessary that



we do so. It is a part of life. And, finally, we must never take any drug or medicine to relieve pain unless it is prescribed by the doctor.

**Coffee and Tea Habits.**—Coffee and tea both contain a habit-forming drug called *caffein*. Although many people use tea and coffee in ways that do little, if any, harm, the habits should be avoided by children. Both are hard on the nerves, and both may interfere with digestion. They may also dull the appetite for the nourishing foods which every young person needs for growth. Like the other habit-forming drugs, they have their traps into which we may thoughtlessly fall. But from what has already been said, you should be able to recognize these traps and to keep out of them.

**How We Break Loose If Caught.**—In breaking a drug habit we follow the same plan as in breaking habits in general. We stop repeating the acts, or doses in this case, that led to the habit in the first place. When we have refrained long enough, the habit, including the appetite for the drug, will disappear. If we have had the habit a long time however, we shall have to make a hard fight to keep from repeating, just as Bruin Junior had to make a hard fight when he was caught. But winning will be as worth while for us as it was for him, and we, also, shall learn a valuable lesson—that of avoiding habit-forming drug traps in the future.

**Facts Learned.**—(1) Traps are good things to keep out of; they are never for the benefit of those who are

caught. (2) There are traps all through life, but the drug traps that catch us while we are young are the worst. They keep our journey of growth from being the great success that it otherwise would be. (3) If we are still free from drug habits, we must remain free. (4) If we have been caught by some of their traps, we must by all means break loose.

### QUESTIONS

1. How do drug habits differ from habits in general?
2. In what sense is the forming of a drug habit often like an animal's being caught in a trap?
3. How is the alcohol habit formed?
4. Which of the alcohol traps was destroyed by the prohibition law? What traps still remain?
5. What is the habit-forming drug in tobacco? In tea and coffee?
6. What are the special reasons for the avoidance of the tobacco habit by the young?
7. John's father was using a package of cigarettes a day when he stopped smoking at the age of twenty. He gave John the problem of finding how much he saved in the next fifteen years by breaking the habit when he did. The cigarettes cost fifteen cents a package and John counted the interest at six per cent and compounded it annually. What was John's answer?
8. Name some drugs for deadening pain. How do we avoid habits of using them?
9. What lesson did Bruin Junior learn from getting caught? What similar lesson should one learn who has formed and broken the habit of using some harmful drug?

## CHAPTER XII

### GROWTH AND PLAY

Youth is generally considered the playtime of life, and there is a good reason why we should play more during this period than later. Play is a great aid in making our growth journey all that it should be.

**How Play Aids in Making Our Growth Journey Safe.**—Less tiring than work, play is especially valuable for the health. It gives pleasant exercise and does not often lead to overexercise. Play takes us outdoors where we are benefited by the fresh air and the bright sunlight. It is an aid in growing up straight and in making growth that is solid and firm, as we have already learned. It has been said that play is Nature's method of making us do important things for the body.

**How Play Helps to Make Our Growth Journey Successful.**—Play of the right kind helps to educate us. It trains the mind in thinking, and certain games train the whole body in acting quickly and strongly when this is necessary. Watch our boys in a game of ball (Fig. 29) or our larger girls in some of their games to see if this is not true. To be able to think and act quickly and strongly is worth much in any one's education. Play also trains us for coöperation, which



means being able to get along with and help others in play and in work. Then certain kinds of play educate us in still another way, as we shall discover later in this chapter.

**How Play Makes Our Growth Journey Happy.**  
—Play is always interesting because we can play at

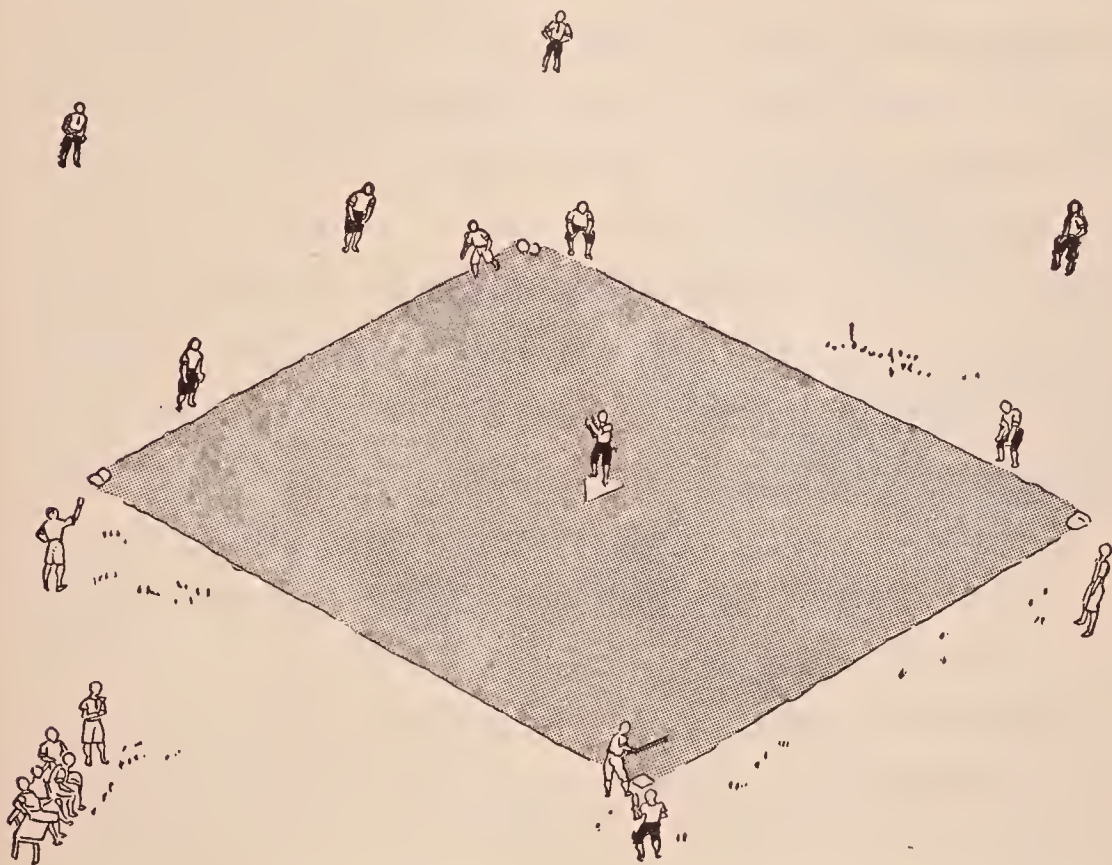


FIG. 29.—A good ball player must have skill, alertness, and good health.

whatever we choose, play as hard as we wish, and stop when we are tired or when we lose interest. Then, with interesting playmates we have the added joys of companionship and of contest. It rests us from our work and makes us forget our troubles, should we have any to forget. Without thinking

about it, we drop into a happy frame of mind, and this we can often carry with us into our work.

While most kinds of play are pleasant and helpful, there are certain kinds that are more helpful than others. We are lucky indeed, if we have some one to advise us in our playing and to help us select the forms of play that are best.

**Purposes Served by Play.**—In choosing the forms of play that seem best for us, we should have in mind the purposes that play can serve. There are four main purposes, as follows:

1. Occupation and amusement. Play gives us something to do which we like. This in itself is enough to make most of us happy. The effect is largely upon our mind.

2. Bodily exercise and recreation. Our purpose here is to improve the health. The effect is largely upon the body.

3. Social training. This means training in the ways of getting along with people and in coöperating with them.

4. Education. This means preparation for the future and includes both knowledge and skill.

**Tools and the Boy's Workshop.**—One delightful kind of play, one which helps educate us, too, is that of making different things. If we can use real tools for this purpose, we accomplish more and enjoy ourselves more, too. Tools are very wonderful things in themselves, and it is a privilege to use them in our play. Of course the tools with sharp edges must be



held very carefully, but boys can be as careful, if they try, as older people. For the beginner only a few of the commoner tools are needed. A knife, a hatchet, a saw, a square, a brace with some bits, and a plane will enable the boy to put pieces of wood into different shapes and to do some real building. If he can then have a place in which to work, a bench on which to hammer and saw, and some drawers for his tools, he will have the beginning of a real workshop (Fig. 30). In this he will spend many happy and profitable hours.

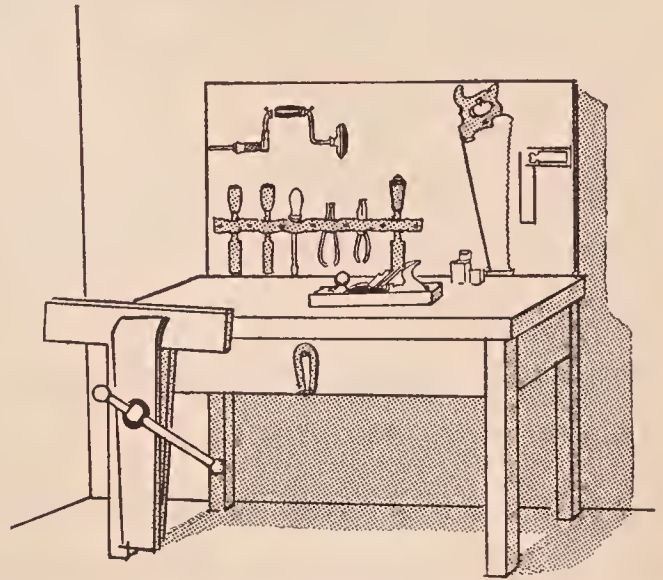


FIG. 30.—A boy's workshop

While the boy has his tools and his workshop, the girl may have hers also. She may have the same tools as the boy if she likes, but she is more apt to want scissors, needles and thread, a cutting board, and a small sewing machine. She will develop skill in her kind of play as well as the boy in his and will get as much enjoyment from it.

**Science and Play.**—In physical science there are many things that delight children in their play. Windwheels, waterwheels, boats, siphons, levers, pulleys, mirrors, lenses, prisms, magnets, batteries, electric lights, toy airplanes, telephones, and radio sets, all make delightful playthings. Play in which we



use the forces and instruments of science, moreover, may lead to important things when we are grown. Edison, you know, played with electricity as a boy, and other inventors and scientists can trace the beginnings of many of their discoveries back to things they played with as children.

**Playing with and upon Musical Instruments.**—Musicians, even more than scientists and inventors, can trace their love for their art and much of their skill back to childhood days. While musical ability with many of them was a natural gift, this ability was developed in ways that were really play. Blowing horns, playing mouth organs, strumming the cords of banjo and guitar, beating drums, and fingering the keys of a piano—what more delightful forms of play could one with a gift for music have?

The number of persons who have found in their play the beginnings of their life work shows the importance of the kinds of play that train our hands and our minds. While we seek the kinds of play that give health and recreation and that train us to coöperate with others, we can also select the kinds that prepare us for future work and study.

**Play and the Building of Character.**—Play of the right kind helps us to build good character. Have you ever been tempted to cheat in order to win over others? Although cheating may help to win the game, we soon find that it makes us lose something that is much more important. We cannot cheat very often without building up a habit of being dishonest.

Then from being dishonest we lose the confidence of others as well as our own self-respect. On the other hand, playing honestly causes us to build up the habit of being honest, and with this we keep our self-respect and the confidence of others. Then, too, keeping good-natured and cheerful when the game goes against us helps to build up habits of self-control and other habits which will be of great importance in later life.

**Rules for Healthful Play.**—In order to make our play serve all the purposes that it should, it is wise to adopt certain rules and then to live up to them. Perhaps you will think some of the following rules are worth adopting:

1. Enjoy your play as much as possible, helping others to have a good time as well as yourself.
2. When possible, play outdoors.
3. Avoid hard play just before and just after meals.
4. In cooling off after hard play, keep out of a draft and use a sweater or some other covering.
5. When playing games to see who wins, play fair. Never try to win by cheating. Character and reputation are more important than winning.
6. Play with vim and courage, especially when the game is against you. If you should lose, be cheerful about it. If you win, let others sing your praise.
7. Avoid excessive fatigue such as you get by jumping the rope too many times. When you are weary from any kind of play, rest.

**When Work Becomes Play.**—With the many

things that we have to do, it is hard sometimes to tell where play leaves off and work begins. But in both we should find health and enjoyment as well as the means for building our minds and our characters. All the rules which apply to play apply to work, and many kinds of work are like interesting games, as we have already pointed out. Most of us find pleasure in accomplishing worth-while things and this pleasure is really as helpful to our minds as the pleasure from actual play.

**Playing the Health Game.**—Both in our work and in our play we have the problem of keeping well. Did you know that this problem could also be managed somewhat as an interesting game? How we are to play at the health game is told in the next chapter.

**Facts Learned.**—(1) Play that is properly managed is one of our best aids to health and growth. (2) It gives us exercise, rests us from our work, improves our appetite and our ability to sleep, and helps to keep us in a happy frame of mind. (3) Certain forms of play prepare us for our future work, and others, if played as they should be, help to develop good character. (4) The spirit of play should be carried into our work and into the things we do in order to keep well.

#### QUESTIONS

1. How does play aid us in our bodily growth?
2. How does it aid us in our preparation for the future?



3. How does play aid in keeping us happy?
4. Name some kinds of play that give us skill in the use of our hands. Some kinds that give us valuable knowledge.
5. How may play help one in building a good character?
6. How does play differ from work?
7. Does play ever become work and work play? Give reasons for thinking so.

## CHAPTER XIII

### PLAYING THE HEALTH GAME

There are two ways of doing the different things that are necessary for keeping well. We may do them as though they were tiresome tasks or we may do them cheerfully and in the spirit of play. You will think of many reasons why the latter way is the better. Furthermore, there is a strong resemblance between managing the health and playing an interesting game.

**How Looking After the Health Is Like a Game.**—Looking after the health is like playing a game, in the first place, because we have something at stake. We win or lose according to how well we play. To keep in good health is to win. To become sick is to lose. In the second place, there is enjoyment in the playing. Much of what we do to keep well, such as taking exercise, going on a vacation, eating three meals a day, and sleeping soundly at night, is real pleasure. We delight in doing these things. In the third place, the victory, which is good health, gives the greatest pleasure of all. Indeed, there is nothing which gives so much joy and happiness as good health.

**With What We Play the Health Game.**—In most of our games there are certain things with which to

play—ball and bat for baseball, net, rackets, and balls for tennis (Fig. 31), and blocks for dominos. Without these the games would not be possible. We play the health game with everything that has any effect upon the body—with food, clothing, air, water, and the other aids of everyday life. We can play with, or use, these aids in very definite ways in winning good health, just as we use mallets and balls in playing cro-

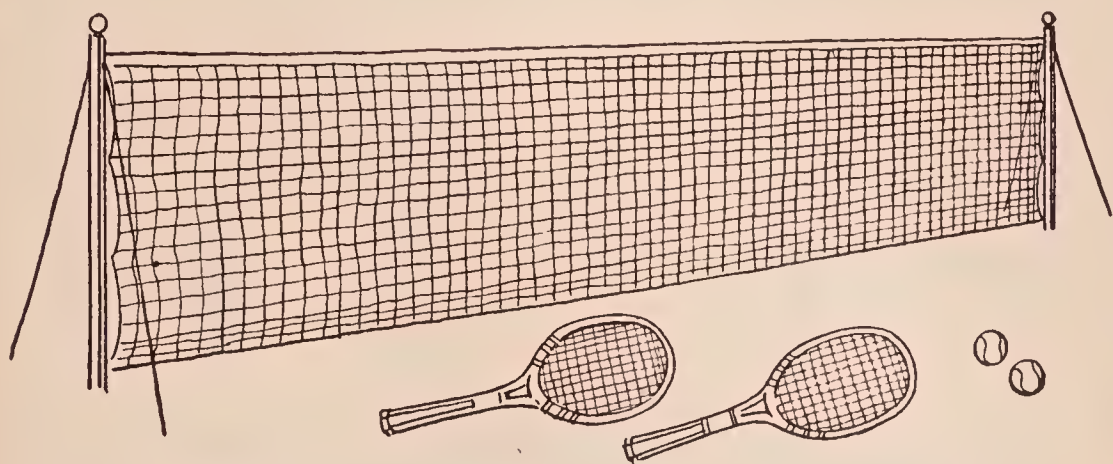


FIG. 31.—Things with which we play tennis

quet, and marbles in playing the springtime game that our boys like so well.

**How We Play.**—Everything that is used in the care of the body may be used in ways that do harm as well as in ways that do good. One playing the health game tries to use everything that affects the body in the way that is best. He makes good plays when he succeeds in doing this, and he makes bad plays when he fails. To make the good plays requires knowledge, and it also requires the skill that comes from practice. This is why some have better success in the health game than others. One can easily fail in doing what



is best for his health, just as he makes bad plays in other games.

**How We Play the Health Game with Food.**—We play with food about as you would expect from what has already been said. We use foods in the ways that do the greatest good and the least amount of harm. We do not make bad plays by overeating, by eating between meals when this is unnecessary, and by eating too much of certain foods, such as meat, or too little of fruits and vegetables. We play well when we eat as much as we need, eat only at mealtime, and eat the foods that are best for health and growth. The general plan was stated by some wise person years ago when he said, “We eat to live and do not live to eat.”

We play the health game with clothing, air, water, and the other aids in much the same way that we play it with foods. We use them in ways that do the most good and avoid using them in ways that do harm.

**The Health Game and Habit Formation.**—You know of course about the game of checkers (Fig. 32) and it may be that you can play it. There are twelve pieces, or “men,” on each side, and each can only move forward until it reaches the last row in the opponent’s field. In that case it becomes a “king,” and it can then move either forward or backward. This makes it a much more valuable piece, and the winning of the game often depends upon who gets the first king. We have something quite similar in the game of health. If we can build our health knowledge into

habits, it becomes twice as valuable in winning good health. While we can hardly say that it then works both forward and backward, we do know that it works much easier and that we do not have to think about each good play that we should make. Hence, as in checkers, we must give our health knowledge this ex-

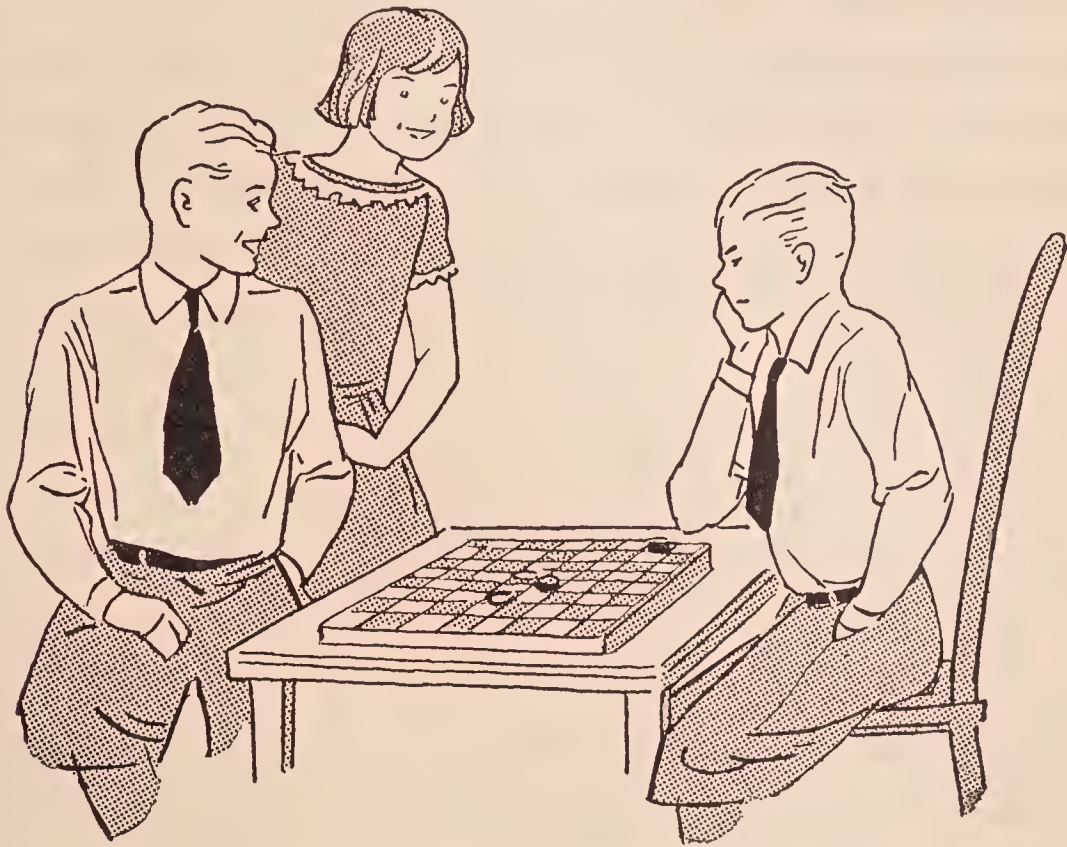


FIG. 32.—A close game of checkers

tra power. Through habit formation we must get as much of it as possible into the “king’s row.”

**Destroy Opposing Habits.**—To have no bad habits is just as important in winning the health game as to form good habits. If our opponent in checkers gets a man in the king’s row before we do, we know how much harder the game becomes for us. If we cannot capture the newly-made king before it is

brought into action, the outlook is discouraging. The same is true of bad habits in the health game. We must keep from forming them in the first place, and we must destroy any that we may have as soon as possible.

**Rules of the Game.**—The health game is a big game, and there are naturally many rules. There are seven general rules that apply to our playing, and there are many more special rules that apply to the things with which we play. The general rules are:

1. Do not worry about yourself.
2. Play fair.
3. Play fully.
4. Play all the time.
5. Build up the weak places.
6. Be a good sport.
7. Help others play.

**The Rule of Don't Worry.**—It is a well-known fact that if we worry about our food after it is eaten, it is less apt to digest properly than it will if we forget it altogether. The same is true of other matters having to do with health. According to this rule, we must be care-free and happy, but do, at the same time, all that we should for ourselves. Worrying about our different organs or our health in general wastes our nervous energy and interferes with Nature's methods of body management and control.

What Nature does for us is always vastly more than what we can do for ourselves. When we are care-



free and happy and do not worry, Nature can do her full share.

**The Play Fair Rule.**—One may be said to play fair in the health game when he does as nearly as he can what he knows is best for the body. Many times, from habit, appetite, or the desire for comfort, we want to do one thing, while our good judgment tells us to do another. It is unfair to the body to do the thing that is harmful. It is also unfair to the body to overwork, to expose ourselves needlessly, to take undue risks, and to go without medical aid when it is needed. In these cases, also, we must learn to play fair.

**The Play Fully Rule.**—The play fully rule is the rule of watching *everything* that affects the health. It is perhaps the hardest of all the general rules to follow. There are so many things to look after that we are very apt to overlook something. The only sure way to avoid this is to form habits of doing the things that we know should be done and to break habits that cause us to do the wrong things. We should have formed by this time at least a dozen health-building habits. Have you as many as that to your credit?

**The Rule of Playing All the Time.**—The one who is every day doing what is best for his body is obeying the rule of playing all the time. He is not careful one day and careless the next. This rule, like the one above, is a hard rule to follow, and the trouble is not always that we forget. Students, for example, often stay up late and study when they know very well what the effect will be. They hope to make up for the loss

of sleep and to win back their health as they have more time. This is not the way to play the health game. One should have system about his studying and his work so that he does not get behind. He should play the game all the time.

**The Rule of Building Up Parts That Are Weak.**—Anything that is wrong about the body is very apt, if it is neglected, to lead to something worse. Like the flat tire or the broken bolt on the automobile, it endangers the whole machine. It is always harder to win in the health game when something is wrong with the body. Our best play, of course, is to rid ourselves of it as soon as possible.

**The Good Sport Rule.**—Good sportsmanship is much talked of in football and the other games played by teams from schools and colleges. The player who is not a good sport is more or less in disgrace. A good sport in the health game is one who plays fair, plays fully, plays all the time, and *plays well when the game is going against him*. He is brave in the face of sickness and other hardships and is not easily discouraged. He can even suffer pain when this is necessary for better health later on. We should all be good sports in the health game.

**The Rule of Helping Others.**—It is by people's helping one another that the world is made better, and helping in the health game is perhaps the best way of all to help. We can help others keep well by the following means:

1. By good advice.

2. By kindness and thoughtfulness.
3. By helping them with their work.
4. By doing what we can to prevent their having accidents.
5. By securing aid for those in distress.
6. By staying at home when we have some kind of sickness that is contagious.

**Facts Learned.**—(1) Looking after the health is very much like playing a game. (2) We play the health game with food, clothing, and the other things that have effects upon the body. (3) The point of the game is to use these things in the ways that do the most good and the least amount of harm. (4) The health game, like every other game, has rules which must be carefully followed. (5) The child who early learns to play the health game will have made a good start on a useful and happy life.

### QUESTIONS

1. In what ways is looking after the health like playing a game? How is it different?
2. With what do we play the health game? How is the playing done?
3. How may we play the health game with exercise? With clothing? With the toothbrush?
4. How do we obtain enjoyment from the health game?
5. How do good habits help us to win? Illustrate with checkers.
6. Why does success in the health game require the breaking of bad habits?



7. Which of the seven rules of the health game do you consider the most important? Why?

8. Why should one not worry about himself? Why must we help others with their health?

9. Give an example in which helping others with their health aids those who do the helping.

## CHAPTER XIV

### OUR TWO HANDS

From our study of things that affect the health and growth of the body as a whole, we turn to things that affect its different parts. We shall begin with the parts most easily studied and those that we know most about—our two hands.

**Organs for Grasping.**—Suppose you lay your left hand, palm downward, on a piece of white paper. Then with a sharp pencil draw a line from the wrist around the hand and each of the fingers and the thumb. Take a little time to study this picture. Note how the hand broadens out from the wrist. Note also that the fingers extend straight forward, while the thumb pushes out to one side. Now hold up your right hand with the palm toward your face. The thumb, you see, is placed almost opposite the different fingers. Try making the end of the thumb touch the end of first one finger and then the other. Now make the ends of all the fingers touch the side and base of the thumb at the same time and into the circle thus formed, push two of the fingers of the left hand. See how easy it is for the fingers and thumb of the right hand to press down on the fingers of the left and hold them tight.

This little experiment shows the main use of the

hands. They are organs for holding objects, or for grasping. This accounts for their peculiar shape, for the long and jointed fingers, and for the thumb's being almost opposite the fingers.

**What Our Hands Do for Us.**—You will get some idea of what the hands do by counting the different things your hands have done since you arose this morning. They held the different pieces of clothing that you put on. They held your knife and fork while you were eating and your cup while you were drinking. At different times they held your books, pencils, and the different things with which you played. They may have held to something at times to keep you from falling. In fact, your hands have been so busy grasping first one thing and then another that you cannot remember them all. How could we possibly do the different things that we have to do for ourselves if we did not have hands? And do you know that man is the only animal that has well-formed hands?

**What Hands Have Meant to the Race.**—Without hands we could not build homes, make machinery, till the soil, cook our meals, clothe our bodies, and do many other things that are necessary to life and health. One of the greatest aids to man in his advancement from the savage state has been the use of fire. But how could he kindle a fire and keep it burning without hands? Clothing has been another great aid. But how could he weave cloth and make it into garments without hands? Tools have also been a



great aid. Without hands he could neither make tools nor use them (Fig. 33). All this suggests what wonderful organs the hands are.

**The Hands and the Brain.**—The brain, our organ of thought, could do very little without our hands. Of course it could make us stand up and lie down and, by directing the feet, could move us from place to place. But what could the brain do in building and manufacture, in writing and printing, in drawing and



FIG. 33.—A few of our many kinds of tools

painting, and in providing the necessities of life, without hands? But the hands are more than servants of the brain. They are helpers and teachers of the brain. Things thought out by the brain may be right or they may be wrong. The hands by putting them into practice enable the brain to test them out. In your studies in school have you noticed how often your hands help your brain in its work?

**The Hands and the Arms.**—Suppose your hands were attached to your shoulders instead of their being

where they are. What would you have to do when you wanted to pick up something? Nature has made



FIG. 34.—Our three-jointed hand extender

the picking up and laying down of objects easy by placing the hands on the ends of two jointed rods, called the arms. There are joints at three places in the arms—at the shoulders, at the elbows, and at the wrists (Fig. 34). In moving the hands through long distances we use the joints at the shoulders. For shorter distances we use the joints at the elbows. And for very short distances we use the joints at the wrists. Try moving

a hand from each of these joints. Without our jointed hand-extendors, or arms, our hands would be of little use.

**The Hands and the Mouth.**—Managing the food while eating is one of the most important uses of the hands (Fig. 35), although this is done easily and without our even thinking about it. If you watch some older person at the table, you will see how well the hands hold the knife and fork as they cut the food and pass it to the mouth. You will also notice the



FIG. 35.—The hands help the mouth in eating and drinking.

care with which the cup or the glass is brought to the lips in drinking. Now after seeing all this watch some animal as it eats and drinks. Having no hands, it must put its mouth into its food and against whatever the food is on. It cannot keep its food clean nor eat it in a sanitary way. We often wonder how animals can keep as healthy as they do.

**Advantages of Two Hands.**—The advantages of having two hands are so numerous that we can scarcely mention them all. Objects that are too large to be grasped by one hand are held by both. Often one hand holds some object while the other hand does something to it or for it. In the small matter of threading a needle one hand holds the needle while the other directs the thread. Like good partners, the hands help each other and work together. If one hand is hurt, the other ties it up. In washing the hands each rubs the water and soap on the other (Fig. 36), and each dries the other with a towel.

By being on the ends of the arms, the hands can do for all the outside parts of the body what they do for each other. They are body helpers and protectors in the fullest sense of the word.

**Growth of the Hands.**—The constant use of the hands for one purpose or another requires that they be kept uncovered most of the time. This is greatly to their advantage. It keeps their growth from being interfered with by pressure from things about them, as sometimes happens to the feet. As far as size and shape go, the hands are free to grow as Nature



intended. But there is a kind of growth for the hands that can be greatly helped by our efforts. This is their growth in skill and deftness.

**Manual Training.**—Manual training means the training of the hands. The hands of human beings must do many things which Nature alone does not prepare them to do. It is not enough for us to grasp



FIG. 36.—The hands washing each other

objects in a rough and awkward manner. We must handle delicate objects without injuring them and be able to fashion rough materials into shapes that are useful and also beautiful. To do this, our hands must be trained in the use of different kinds of tools. Such training is of the greatest importance both to the hands themselves

and to the brain which directs them.

All children should have the growth in skill and deftness that comes through manual training. If this is not provided for in your school, try to have a home workshop, even if it must be only a very small one with few tools.

**Health Dangers from Hands.**—In their regular, everyday work the hands must touch many things

that are dirty and that have upon them germs that cause disease. In this way the hands themselves get dirty and pick up many germs. The hands can then put the germs upon whatever they touch. They may put the germs upon food that is being eaten, upon the clothing, or upon some object that later is placed in the mouth or over the face. In this way it is possible for the hands to spread disease. The way to prevent this is to keep the hands clean.

**How to Wash the Hands.**—Sometimes we need only clean water for washing the hands, but every child knows that water alone is not always enough. Good soap is needed quite often. If the hands are dirty, we first rub them with a lather made by soap and water on the hands themselves. With clean water we then rinse the hands to remove the lather. This is important, for soap left on the hands may injure the skin. After the soap is all removed, we dry the hands with a clean towel.

**When to Wash the Hands.**—The hands should always be washed when the dirt shows. This will aid in keeping our books and clothing clean and will be better for our health. Then, too, we are more attractive and pleasing to other people when our hands are clean. But certain kinds of dirt on the hands, although it may not show, may be very harmful to the health. This is why we should early form the habit of washing the hands after going to the toilet. The smallest particle of body waste to get on the hands may contain dangerous germs. We should

also form the habit of washing the hands just before eating. This is to keep dirt and germs from getting on our food as we eat it.

**Keep the Nails Clean.**—The finger nails are very interesting and useful parts of the body. They protect the ends of the fingers and are a great help in picking up small objects. You could not pick up a pin or a needle from the floor without the stiff nails on the ends of the fingers. But dirt and germs collect easily under the nails. Look at your nails to see if there is not a narrow line of dirt under them. Proper care of the nails includes both trimming them and cleaning them. The nails should be trimmed short and round like the ends of the fingers. For getting dirt from under the nails and also from around the nail on top, a stiff splinter or a strong, wooden toothpick will serve quite well.

**Protect the Hands.**—On account of their work the hands are more exposed than most of the other parts of the body. In grasping things that are too hot, or too rough and sharp, or sometimes in holding frightened animals they are often in danger of being injured. Then, too, the hand that holds the nail for the other hand to strike with a hammer is often struck accidentally. By thinking about the ways in which the hands may be injured, we can plan how to protect them. Of course any small wounds on the hands must be treated with some germ-killing substance in order to prevent further trouble.

**Habit Formation for the Hands.**—If you do not



have these habits already, begin forming them at once:

1. Keeping the hands clean.
2. Keeping finger nails trimmed and clean.
3. Washing hands after going to the toilet.
4. Washing hands before each meal.

Break any of these habits that you may have:

1. Biting the finger nails.
2. Picking at nose or putting fingers in mouth.
3. Using fingers instead of knife and fork in eating.
4. Carelessness in the use of dangerous tools.

**Facts Learned.**—(1) Our hands serve as organs for grasping, or holding, different objects and as such are instruments of the brain. (2) Their value is increased by the arms, by their working together as occasion requires and by the development of skill and deftness. (3) But because of the things which we daily handle, the hands may be the means of spreading harmful germs. (4) To prevent this, they must be kept clean and protected in various ways.

### QUESTIONS

1. Show how the hands are able to grasp objects.
2. What purpose is served by the part of a tool called the handle? Account for the name.
3. Why do the tools shown on page 109 have different kinds of handles?
4. Name some uses of the hands that do not depend upon grasping.

5. How have the hands aided in building up the world we all enjoy today?

6. How do the arms increase the usefulness of the hands?

7. What are the advantages of having two hands? Can we properly speak of the hands as partners? Why?

8. What different parts of the body can be reached by the hands? What uses of the hands does this suggest?

9. For what kinds of work do the hands need training?

10. How may the hands spread disease? How is this prevented?

11. Describe a good way to wash the hands. How are the finger nails trimmed and cleaned?

## CHAPTER XV

### OUR TWO FEET

Our feet are almost as interesting and useful as our hands. The health game is played in part by them, and we need them on all kinds of journeys, including our journey of growth.

**What Our Feet Do for Us.**—Our first thought is that the feet are for supporting the weight of the body or for holding us up. This of course they do, but if it were their main use they would not have to be the shape and size they are. To show the main purpose of the feet, we shall perform a simple experiment. Here is a straight stick which is about as long as some of you are tall. Let us try making it stand up as you are able to stand. You see that it cannot stand alone. But here is a short board with the pointed end of a nail sticking up from the middle. We drive this nail into the end of the stick so that the stick and the board are held together. The stick can now stand on end without any trouble (Fig. 37). The short board does for the stick what the feet do for the person.

**The Feet Form a Base for Balancing the Body.**—Without feet on the ends of our legs it would be as hard for us to stand upright as for the unaided stick to stand on end. To prove that this is true, try stand-



ing still on your heels. It is impossible to do so, is it not? To stand this way at all, you must keep moving about. But how easily you can stand up straight and perfectly still when you stand on all of both feet instead of on the heels only. The feet give us a broad base upon which to balance the body. There is also

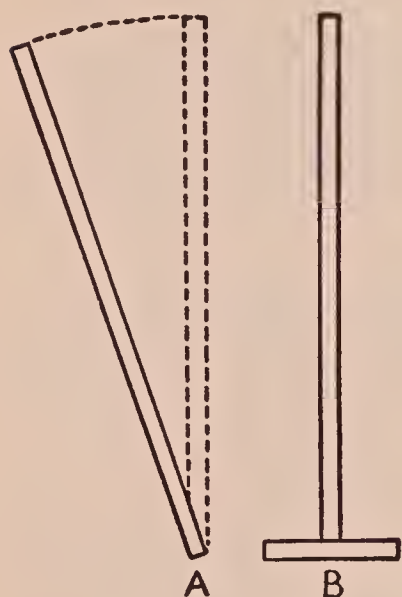


FIG. 37.—How a stick may stand on end

a good reason for our having two feet instead of one broad base like the board on the end of the stick.

### Advantages of Two Feet.—

Try standing with the feet side by side and touching. Note how easily you fall in a sideward direction. Now let yourself start to fall sideward and see what you do to keep from falling down. A foot flies out quickly to make a brace for checking the fall. With two feet that can be moved in different directions, we can brace

ourselves on all sides. This is shown by the positions taken by our feet when any kind of a push is expected.

**Other Uses of the Feet.**—Besides the main use of the feet, which is that of balancing the body in an upright position, they have five other uses. They support the weight of the body. They aid in walking and in running. They act as springs for lessening the jars and shocks that come from running and jumping. They can be used in working different kinds of

machines. And they can be used as weapons for defending ourselves (Fig. 38). But it makes a big difference whether our feet are healthy and of the right shape and size, or whether they are weak and diseased and out of their natural shape.

**How Our Feet May Cause Poor Health.**—To have anything wrong with the feet is bad for the

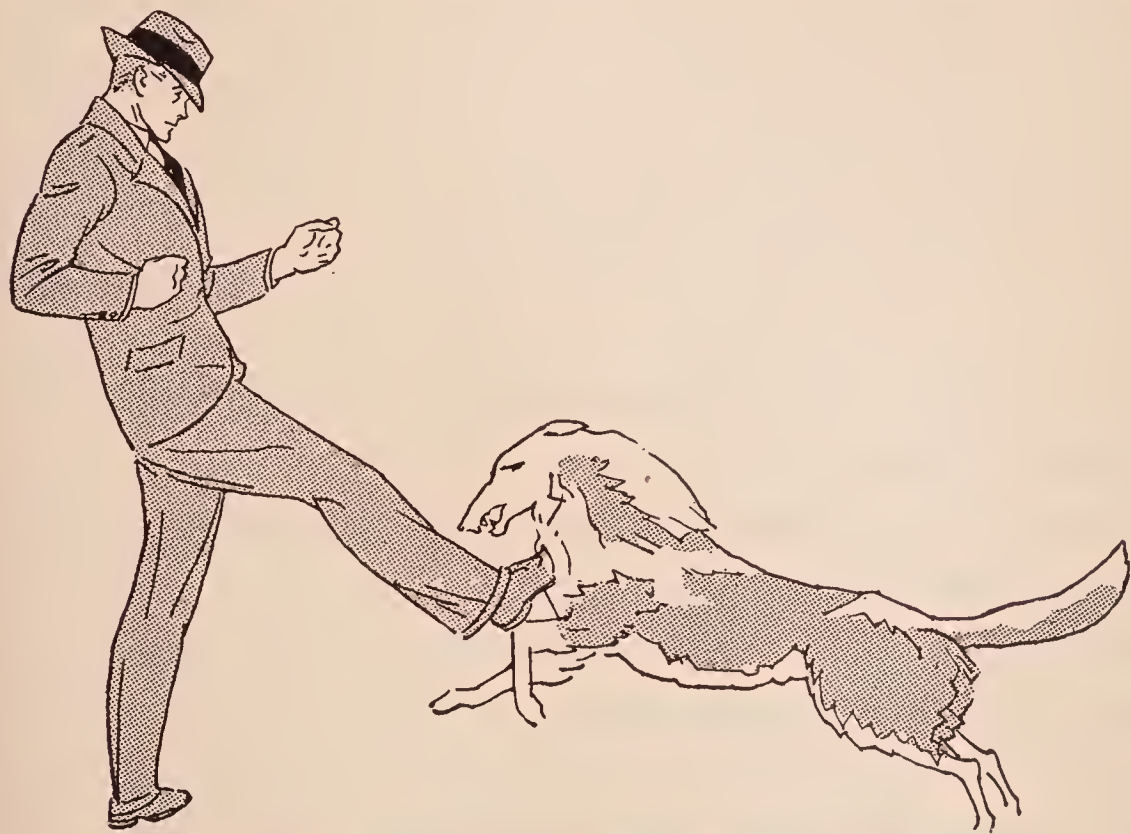


FIG. 38.—The feet as weapons of defense

whole body, as well as for the feet themselves. For one thing, it keeps us from exercising as we should, and lack of exercise is a cause of poor health. Sore places on the feet are hard on the nerves. When our feet hurt, we cannot study and often cannot sleep. Sore feet and feet out of shape cause children to stand in bad positions and to grow out of shape, as we learned from Chapter V. And if germs get into the

sore places, they can increase in numbers and spread to all parts of the body. For health in general, as well as for the purposes which the feet serve, we must give these parts all the care they need.

**Feet and Shoes.**—The feet, like the body as a whole, may be made to grow into the wrong shape. Unlike the hands, which are free to grow as Nature intended, the feet are enclosed in shoes. If the shoes are the right size for the feet and have the same shape, they are a great help to the feet and do them no harm. But if they are of a shape different from that of the feet, or if they do not fit, they hurt the feet and may cause them to grow into an unnatural shape. Some of you may know from experience how easily the shoes can hurt the feet.

**Why Foot Troubles Increase with Age.**—Children under four have very little trouble with their feet. Children in the grades have some trouble, but those in the high school have much more. During the “teen” age there is a rapid increase in corns, bunions, weak arches, and other foot troubles, while the worst time of all for the feet is when one is becoming full-grown. The cause of this increase in foot troubles is the change in the kinds of shoes that are worn. Children’s shoes are usually made as they should be, and parents are careful to have them fit. On entering the “teen” age, young people begin to select shoes for themselves, and often they are guided more by what seems pretty and stylish than by what is best for the feet. The result is shoes that do harm.



**What Our Shoes Should Do for Us.**—When shoes are properly made and fitted, they protect the feet in different ways and aid them in their work. The child with strong and comfortable shoes can run over rough and stony places without hurting his feet. He can go out in rainy weather without getting them wet. And with warm stockings inside the shoes he can run over snow and ice without getting his feet cold. Then shoes are a real help in balancing the body and in going about. In order to have shoes that serve these purposes and do not injure the feet, we must be careful when we select them.

**How to Select the Right Shoes.**—When we go into a store to buy shoes, we are shown several makes and sizes. Some are too large, and some are too small. Some are of a kind to keep the feet healthy and in the right shape. Others, alas, will hurt the feet and press them out of shape. The main points to keep in mind in making a good selection are as follows:

1. The shoes must be large enough. With the child they must be slightly overlarge in order to allow for growth.

2. They should have the general shape of the feet (Fig. 39). This means that the toes must be broad and that the inner edge of the sole and the upper must run almost straight forward to the toe.

3. The heels must be broad and low—less than an inch high for children under twelve.

4. The leather must not press down upon the feet

from above, and the soles must be at least a quarter of an inch thick.

5. The shoe as a whole must be strongly built. It must stand the rough wear that comes from taking our needed exercise outdoors.

Many of the shoes that have all these good points are also pretty, and some of you will select these in-

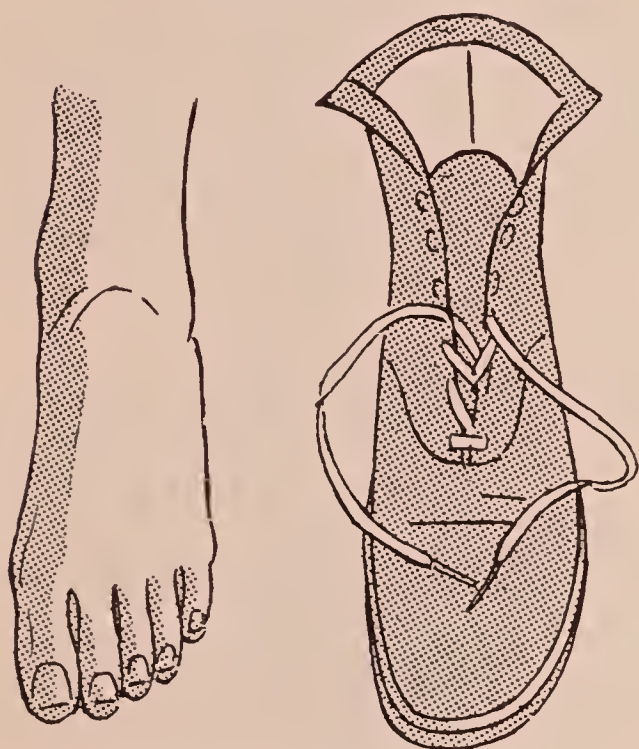


FIG. 39.—The shoe should have the general shape of the foot.

stead of the shoes that do not look so well. But it is a mistake to buy shoes just because they are pretty. If they hurt the feet in any way, they will destroy much more beauty for the body as a whole than they can possibly give to the feet.

**Breaking In the New Shoes.**—After the right shoes are bought they must be made to work easily on the feet. This takes time and careful management. If the soles are too stiff, we can soften them somewhat by working them back and forth with the hands. If some part rubs or pinches, the shoe must be taken to a shoe shop, or store, where the part can be stretched with a tool kept for that purpose. But most important of all is to stop wearing the new shoes when they

begin to hurt the feet. The old shoes must then be put on and worn until the feet are rested from the effects of the new shoes. One should not expect to wear a pair of new shoes all the time until a week or more has passed after he first put them on.

**The Right Shoes Cure, as well as Prevent, Foot Troubles.**—The right shoes cure foot troubles by removing the causes that lead to them in the first place. Take corns as an example. The corn is a thick place in the skin of the toe that comes from pressure or rubbing. Bad shoes are nearly always to blame for corns. To cure a corn, we simply wear shoes that do not rub or press upon the toes. The corn then gets well of itself. Corns cured in this way do not come back as they do when they are removed with medicines and without removing the cause. Bunions, ingrown toenails, weak foot arches, crowded toes, and tender heels are all greatly helped by properly made and fitted shoes. But better than curing these troubles is preventing them with good shoes in the first place.

**Our Stockings.**—Stockings keep our shoes from rubbing the feet and in winter keep the feet warm. They too should be chosen carefully. Their weight must be in keeping with the weather, and they must be neither too large nor too small. If they are too large, they form folds that irritate the skin and cause corns. If they are too small, they press the toes together and may cause ingrown nails. The usual plan is to select stockings that are a full size larger than the ones that snugly fit the feet.



**How to Walk.**—Of course we all know how to walk, but do we know how to walk in the way that is best for the feet and for the health? Have you ever noticed the different ways people have of placing their feet in walking? Some turn their toes in, some turn them out, and some point them straight ahead. The proper way is to toe straight ahead (Fig. 40). To turn the toes in makes one look and feel awkward.

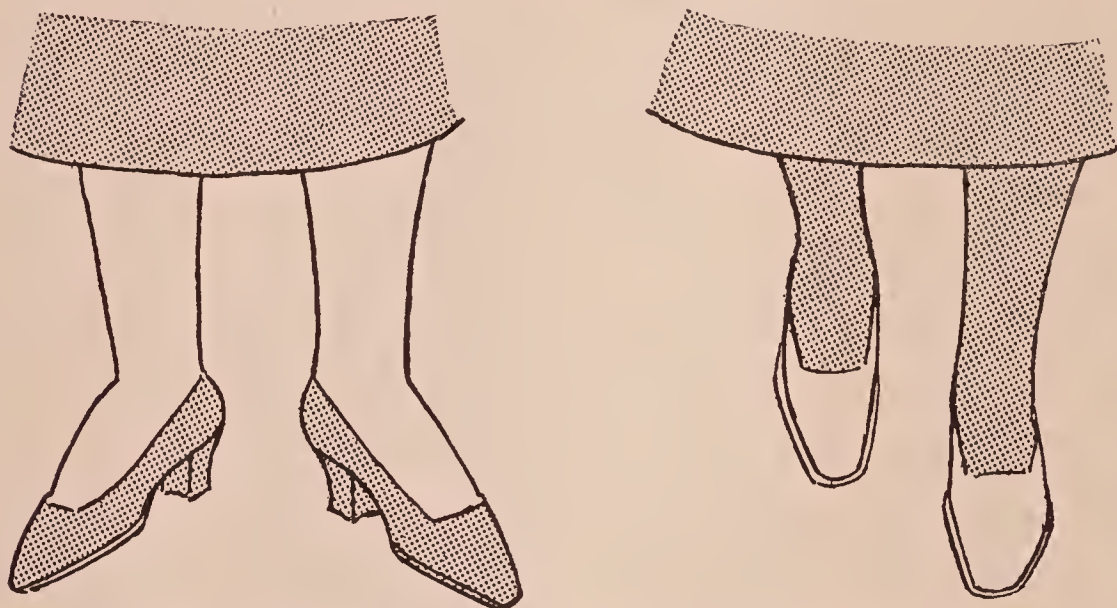


FIG. 40.—In walking we should toe straight ahead.

To turn them out causes the feet to turn on their sides, and this weakens the foot arches. If you do not already toe straight ahead in walking, you should begin to walk this way at once. It strengthens the foot arches and is also the easiest and most graceful way to walk when once we form the habit.

**The Foot Arches.**—The two feet have three arches. This statement sounds queer, but it is true. Each foot has a whole arch from front to back and a half-arch from the highest point on the top of each

foot to the outside. To form the whole arch from side to side we stand with the inner sides of the feet touching (Fig. 41). The arches act as springs in the feet to protect us from jars and shocks and are an aid in walking and in running.

Unfortunately the foot arches are rather easily injured. When the injury is so great that in standing the middle of the foot is flat on the ground, the condition is called "flat-foot." This takes the spring out of the feet and much of the spring out of life. It is also a painful condition and one that is far too common.

**Care of the Foot Arches.**—Although injuries to the arches are hard to cure, they are

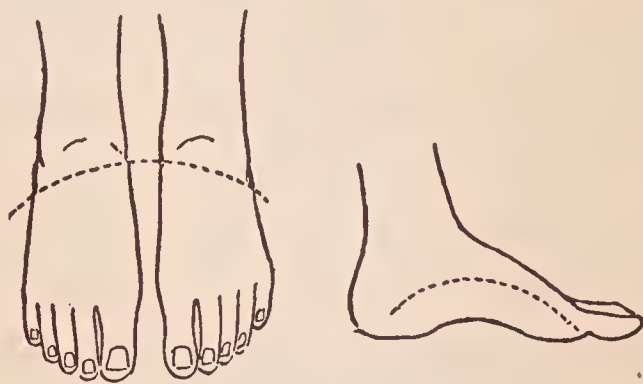


FIG. 41.—Two of our foot arches

easily prevented. We prevent them by wearing the right kind of shoes, by walking in the right way, and by taking exercises that strengthen the arches. The kinds of shoes that prevent broken arches are those with low broad heels. High heels weaken the arches, and after they become weak, they can be broken down by ordinary exercise. But one used to very high heels should not exercise in shoes with very low heels.

When one changes from shoes with very high heels to shoes with low heels, he should make the change gradually. He should begin by getting shoes with heels about one-half inch lower than the old ones and

the next ones slightly lower than these. This avoids the strain upon the weak arches before they are ready to stand it.

**Marches for the Arches.**—Besides toeing straight ahead, there are several ways of walking, or marching, that greatly improve the strength and firmness of the foot arches. One of these is to march for short distances with the feet turned over on their outer sides. Another is to march “pigeon-toed,” or with the toes turned inward. And still another is to march on tip-toe. It makes an interesting indoor exercise for the pupils to march around the schoolroom, each holding himself up straight and at signals from the teacher changing from one way of marching to the other. Ready! Forward march! Toe straight ahead! Now march on sides of feet! Now march pigeon-toed! Now march on tiptoe! Now toe straight ahead!

**Keep the Feet Warm.**—Warm feet are necessary both for comfort and for good health. When the feet are cold, very little blood is flowing through them, and because of this lack we have too much blood flowing to other parts of the body. We keep the feet warm by plenty of exercise such as walking, by wearing warm shoes and stockings,\* by exposing the feet at times to cold as we do our hands, and by putting extra covering over the feet on very cold nights. Keeping

\* Stockings that are too warm cause the feet to sweat, and sweating cools the feet. Because cotton stockings do not sweat the feet, they keep them warmer, as a rule, than do woolen stockings.



the feet warm and dry protects us from colds and sore throat and is good for our nerves.

**Keep Toenails Trimmed.**—One reason for keeping the toenails trimmed is to protect the stockings. The stiff big toenail with its sharp edge is sure to cut a hole in the stocking if it is allowed to grow long



FIG. 42.—One result of sharp toenails

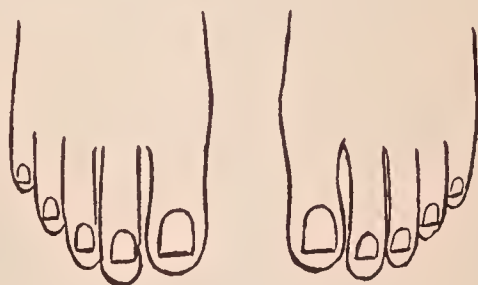


FIG. 43.—The nails trimmed properly

(Fig. 42). So keeping them trimmed saves work and expense on the part of our parents. Then if the toenails are trimmed properly, it is also a means of protecting the toes. The nails should be cut straight across, as shown in Figure 43, so that they are as long at the edges as they are in the middle. This keeps them from cutting into the flesh at the sides and causing the so-called “ingrown nails.”

**Habit Formation for the Feet.**—If you do not have these good habits already, begin to form them at once:

1. Using care in the selection of shoes.
2. Keeping the toenails properly trimmed.
3. Toeing straight ahead in walking.

If you have any of these bad habits, begin breaking them today:

1. Selecting shoes simply because they are pretty and forgetting that they must be of the right shape and fit properly.
2. Toeing out in walking.
3. Toeing in.

**Facts Learned.**—(1) The feet are among the most useful and interesting parts of the body, but they are often much abused. (2) The worst enemies of the feet are misfitting shoes and shoes of the wrong shape. These press the feet out of their natural shape, develop sore places, and weaken the foot arches. (3) On the other hand, well-fitted shoes of the right shape and well-fitted stockings are our best aids in foot health and comfort. (4) We must also walk in a proper manner and take special exercises to strengthen the foot arches.

### QUESTIONS

1. What is the main use of the feet? What other uses do they have besides this one?

2. Why are our two narrow feet better for balancing the body than one broad foot would be?

3. Why does one in throwing often place one foot in front of the other?

4. How may troubles of the feet injure the whole body?

5. Because their feet are bound from very early life to maturity, some Chinese women have feet but little larger than those of infants. What are the objections to feet so small?

6. Why should tall people have longer feet than those who are short?

7. What purposes are served by properly made and fitted shoes?

8. What points must be watched in making a good selection of shoes?

9. How do we "break in" a new pair of shoes?

10. Describe the foot arches and give their uses.

11. How may the foot arches be strengthened?



## CHAPTER XVI

### THE MOUTH

A part of the body requiring even more attention than the hands or the feet is the mouth. Especially must this part of the body be carefully looked after during our journey of growth.



FIG. 44.—The mouth gives expression to the face.

**Uses of the Mouth.**—The mouth, like the hands and the feet, has many uses. Its main uses are for chewing and tasting food and for talking. Besides these, it is used at times for breathing, for coughing, for singing, for whistling, and for swallowing. The mouth is also used in expressing our feelings.

Pleasure is shown by smiles and laughter (Fig. 44), and displeasure by set jaws and pouting lips. In eating, drinking, talking, laughing, singing, whistling, breathing, and coughing, the mouth is busy most of the time.

The mouth includes all the space between the two jaws. It is surrounded by the lips in front, the cheeks at the sides, and a thin curtain called the *soft palate* at the back, and it contains the teeth and the tongue. Its uses depend upon these different parts.

**The Teeth.**—The first thing we see when a person opens his mouth the least bit is the teeth. They are in two rows, one above the other, and are firmly set in the jaws. The upper jaw is firmly joined to the rest of the head and can move only as the head moves.

The lower jaw can move up and down, backward and forward, and sideways, while the head is held still. This lets the lower row of teeth work against the upper row as they must do in biting and in chewing. Of course you know about our two sets of teeth. The teeth belonging to the first set are called the *temporary teeth*. Those belonging to the second set are called the *permanent teeth*.

### The Temporary

**Teeth.**—For about the first six months of a child's life no teeth are visible. There is no need for teeth at this time, for the baby's food is milk, and milk is a liquid. Between the fifth and the eighth month, the first four teeth are cut. These are directly in front, and the two lower ones usually come in before the two upper

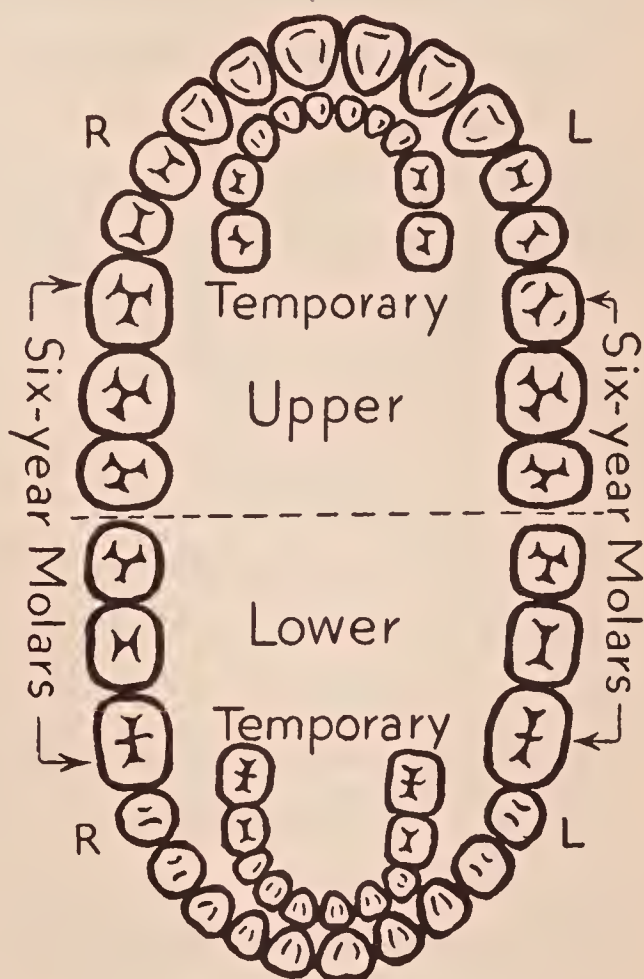


FIG. 45.—The temporary and permanent teeth

ones. By the time the child is three or four years old he will have cut all his temporary teeth. There are ten of these in each jaw, or twenty in all. They are also known as the "milk teeth" and the "baby teeth." The number and kinds of temporary teeth and their places in the jaws are shown in Figure 45.

**The Permanent Teeth.**—When a child is five or six years old, it begins to cut its permanent teeth. The first four of these to appear come in just back of the temporary teeth, one above and one below on each side, and are called the *six-year molars*. They are given this name because of the age at which they are cut and because they are used in grinding the food. From now until one is twelve to fourteen years old, and later in some cases, one is losing his temporary teeth and cutting his permanent teeth. There are sixteen permanent teeth in each jaw, thirty-two in all. They, also, are shown in Figure 45.

**How the Temporary Teeth Are Exchanged for the Permanent.**—Just beneath the temporary teeth are the buds from which the permanent teeth grow. As the jaws grow and there is more room, the permanent teeth are also growing. As they become larger, they press against the roots of the temporary teeth, and this causes the roots to dissolve, somewhat as ice melts in warm water. This makes more room for the young permanent teeth, which keep on growing and pressing and causing the temporary teeth to dissolve more and more. After all the root of a temporary tooth has dissolved, the tooth loosens, as it now has



nothing to hold it in place except the gum. In only a short time it can be pulled out with the fingers. Soon after this the permanent tooth can be seen in the place left vacant by the temporary tooth.

**Care of the Teeth.**—The teeth require two kinds of care. One kind of care is that which we can give them ourselves. The other is the kind which the dentist must give them for us. While we can depend upon our own efforts for keeping the teeth clean, the dentist must fill decayed places, straighten teeth that are out of line, and do at times other needed work. Our own work and that of the dentist are both very important.

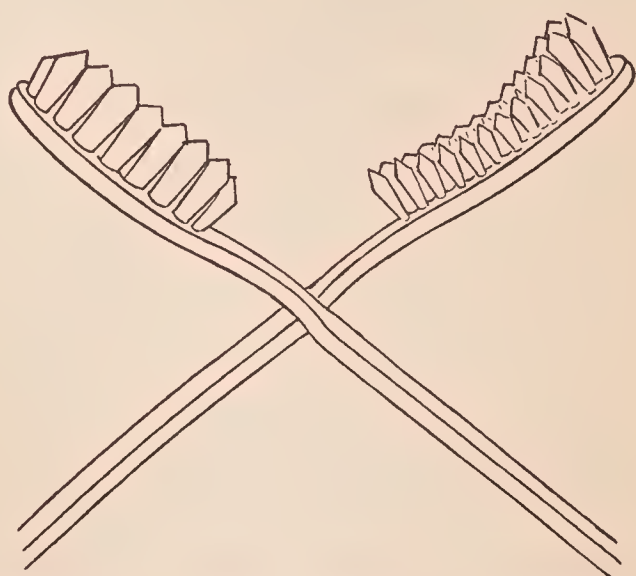


FIG. 46.—Two kinds of toothbrushes—both good

**To Clean the Teeth.**—The two main things needed for cleaning the teeth are clean water and a good toothbrush. We want a toothbrush with stiff bristles and one that will brush between the teeth and remove bits of food that lodge there (Fig. 46). It takes considerable practice to brush the teeth in the right way, but every child should keep trying until he knows just how it is done.

The best place to start is with the outer parts of the back teeth. Dip the brush in water and place it far

back between the teeth and the cheek, the bristles touching the upper row. Now with the jaws slightly separated, push the brush backward and downward to the lower gums and then forward and upward to the upper gums. Then keep up this movement: back-

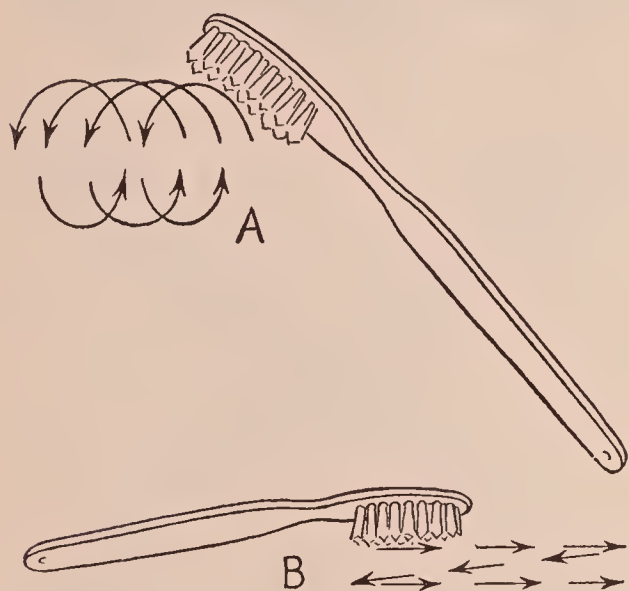


FIG. 47.—In brushing the side teeth, move the brush in small circles.

ward, downward, forward, upward—making little circles as we go all around the outsides of the teeth (A, Fig. 47).

To brush the inner sides of the teeth we use the up-and-down and forward - and - backward stroke, except for the front teeth. Here we can do best with the end of the brush and by an up-and-down stroke only. After doing the outer and inner sides of

all the teeth we still have two other places to brush. One of these is the biting surfaces of the teeth above; the other, those of the teeth below. Both of these are done by short movements of the brush pressed against the tops of the teeth (B, Fig. 47).

**The Brushing Time.**—To do anything well takes time. It takes from one to two minutes to brush the teeth thoroughly, and we should time ourselves to see that we brush as long as we should. Best authorities say that we should brush our teeth four times a day—

after each meal and on rising in the morning. There is no danger of keeping the teeth too clean or of injuring them by too much brushing. If we brush them but once a day, this should be after supper. This will keep food from remaining between the teeth overnight where it is likely to decay. Decaying food injures the teeth.

**Toothpick or Dental Floss.**—For removing bits of food from between the teeth we have our choice between dental floss and the wooden toothpick. Many prefer the dental floss because they can clean the teeth better with it and can do so without harm to the gums. A piece of floss about three inches long is held at the ends by two fingers from each hand and then drawn carefully between all the teeth. The wooden toothpick, on the other hand, is less expensive than the dental floss and is more easily used, but it is more likely to injure the gums. If we use a wooden toothpick, we must be careful to avoid picking the gums. We must pick the teeth instead.

**Rinsing the Mouth.**—In addition to brushing the teeth and removing bits of food with dental floss or the toothpick we should rinse the mouth after each meal, especially after the last meal of the day. Rinsing is to clean the tongue, the inner sides of the cheeks, and the roof of the mouth. It is done in this way. Take a small mouthful of water and work it back and forth between the teeth with the cheeks. Then expel this and take in another small mouthful and repeat. A third mouthful will complete the rinsing and give



the mouth a feeling of cleanness that will last for some time.

**What the Dentist Does for the Teeth.**—The main thing that the dentist does is to stop the decay of teeth when this gets started. With sharp instruments he first cuts out all the decayed portion of the tooth. Then he dries the cavity thoroughly and fills it with metal or some other substance. The result is to stop the decay immediately. Besides filling the teeth when they become decayed, the dentist should at times clean and polish them. If the teeth become discolored or have deposits on them that cannot be removed by the brush, we must go to the dentist to have them cleaned. The dentist should also be seen when our permanent teeth are not forming in regular rows as they should.

**How Irregular Teeth Are Brought into Line.**—When the permanent teeth are coming in to replace the temporary teeth, some of them may be considerably out of line. The dentist, however, can guide them in their growing so that each will finally be in its exact place. On this account, when the child is shedding his temporary and cutting his permanent teeth, he should see the dentist every three months. This will give the dentist a chance to correct any trouble before it gets too far along. However, it is not too late to help irregular teeth after they are through growing, though this is harder to do. By suitable braces fastened to the teeth they can be pressed into line and the mouth greatly improved in appearance. All through our journey of growth it

is possible for the dentist to do much to improve the faulty teeth that give a bad appearance to the mouth.

**Care of the Temporary Teeth.**—The temporary teeth need the same care as the permanent teeth. They need this care for their own sake, and they need it for the sake of the teeth that come later. Each place that is occupied by a temporary tooth is to be filled later by a permanent tooth. If the temporary tooth is lost from the mouth before it is forced out by the permanent tooth, the tooth next to it on each side crowds into the place. This leaves little or no room for the permanent tooth. This is one of the main causes of irregular permanent teeth.

We care for the temporary teeth in the same two ways that we care for the permanent teeth. By keeping them clean and having decayed places filled, we can usually keep our temporary teeth as long as Nature intended.

**Care of the Six-Year Molars.**—The six-year molars are the first of the permanent teeth to be cut, as already explained. They are the sixth teeth in order as we count back from the center above and below on each side. They are the most important of the molars, or jaw teeth. From their position in the middle of the jaws they serve as braces for the teeth that are in front of them and for those that are back of them. They decay very easily and are often neglected because they are mistaken for the temporary teeth. Figure 45 shows in what parts of the jaws to look for the six-year molars.

If the six-year molars show signs of decay, we should see a dentist at once. It is a good plan, even when we think there is nothing wrong with the teeth,

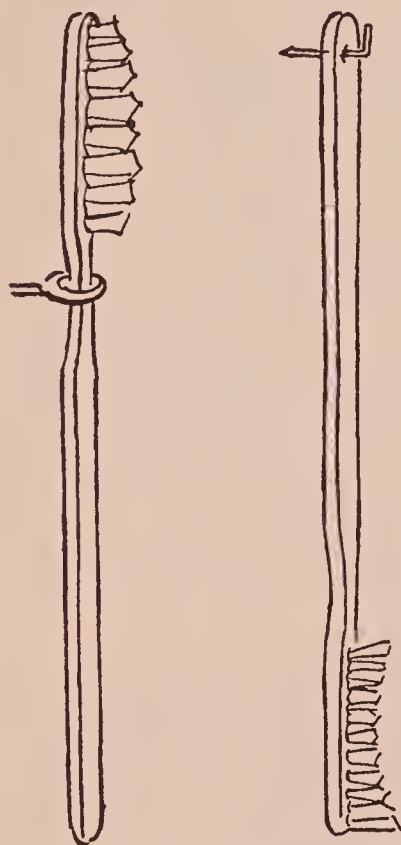


FIG. 48.—Toothbrush holders

to see a dentist every six months. He can then check any decay of our teeth before it has had much time to start.

**Tooth Powder and Paste.**—It is sometimes a help to use on the toothbrush a small amount of tooth powder or paste. We should not form the habit, however, of using something of this kind every time we brush the teeth. The habit is expensive and there is danger of injuring the teeth. A good brush and clean water are all we need for regular use. Plenty of brushing is the main thing.

Even when we use tooth powder or paste we must remember that it is the thorough brushing that counts.

**Care of the Toothbrush.**—Each child must, of course, have his own toothbrush. It is even better to have two brushes and to use one brush one day and the other brush the next day. After using the brush it should be washed with clean water and then placed in a special holder. A screw eye just large enough to take the handle makes a very good holder, but a brush with a hole in the end of the handle can be hung on a



small hook (Fig. 48). Once a week the brush should stand overnight in strong salt water. This kills any germs that may be in the brush.

**Food and the Teeth.**—Even more important for the teeth than frequent brushing, is food of the right kind. To make good teeth the body must have a good supply of mineral salts and vitamins. This means that we must have a pint or more of milk each day and plenty of fruits and plenty of green vegetables. Foods that require chewing are good for the teeth as they give them needed exercise and aid in keeping them clean. Too much candy causes tooth decay. Remember to eat your candy as a part of, or just following, the regular meal.

**Habit Formation for the Teeth.**—If you do not have these habits already, begin to form them at once:

1. Daily washing of teeth with brush and water.
2. Daily use of milk, fruit, and vegetables. Thorough chewing of the food.
3. Seeing the dentist at once when any kind of tooth trouble is suspected.
4. Having teeth examined by the dentist every six months whether we know anything to be wrong with the teeth or not.

Break any of these bad habits that you may have:

1. Biting hard substances and cutting thread with the teeth.
2. Eating candy between meals.
3. Using too much tooth paste or powder.

**Facts Learned.**—(1) The mouth should have special care all through our journey of growth. (2) While many things need to be looked after, the teeth are the parts that require most attention. (3) We must keep them clean by daily brushing and by the use of dental floss or the wooden toothpick. (4) We must see the dentist frequently in order that he may stop tooth decay when it starts and keep the teeth even and in line. (5) We must have at least a pint of milk each day and eat plenty of vegetables.

### QUESTIONS

1. Name all the uses of the mouth.
2. What purposes are served by the teeth?
3. Why do we have two sets of teeth? In what ways do the temporary differ from the permanent teeth?
4. How does one give his teeth a thorough brushing?
5. When must the dentist clean our teeth?
6. A temporary tooth coming out in the natural way has no root. If it is extracted before this time, it has a root. Explain.
7. How does the dentist stop decay of the teeth?
8. Why must we keep the temporary teeth clean and have decayed places in them filled?
9. What foods are best for the teeth? How do we keep candy from injuring them?
10. What teeth are called six-year molars? Why do they need special care?

## CHAPTER XVII

### OUR EYES

To go even a short distance with the eyes shut is both difficult and dangerous. Do not try it. Good eyes are needed for our journey of growth, as well as for traveling about.

**Uses of the Eyes.**—Our eyes are instruments of sight. They enable us to see objects both when they are near and when they are far away. As instruments of sight they aid the mind in getting information of all kinds. You know how much you use your eyes in reading and in other kinds of school work. The eyes also guide the body in its different movements. Without our thinking about it they direct us as we go from place to place, and they guide our hands as we reach out for objects or put them away.

Another use of the eyes, but one which does not depend altogether on sight, is that of an aid to a good appearance. Even more than the mouth they aid in giving the face its different expressions. If they are bright and steady, they always make a good impression for their owner (Fig. 49).

**Healthy Eyes for Work and Beauty.**—For the eyes to serve their purposes in the best way they must be in good condition. It matters little about their



color either for work or for looks. Brown eyes, blue eyes, gray eyes, and black eyes are all pretty and all work well so long as they are healthy. To keep them healthy we must look after them in three ways, as follows:

1. Protect them from accidents.
2. Keep them free from germs.
3. Keep them from becoming strained.



FIG. 49.—Healthy eyes are a valuable aid to beauty.

**How Accidents to the Eyes Occur.**—To avoid accidents to our eyes and to the eyes of others, we must know the ways in which they are most likely to be hurt. The eyes have lids, which shut quickly to keep out dust and small objects that come near them. They are placed in

deep, bony sockets, which protect them from behind and above and from both sides. And they have the nose in front to help protect them in this direction. So the eyes are not apt to be hurt if we fall or if large objects strike the head. The nose, the bones around the eyes, or the back of the head will receive the hard knocks instead. But the eyes have little or no protection from small or pointed objects that may come toward them with force from the front. It is from such things that we need most to guard our eyes.

**When to Be Careful about the Eyes.**—We should be especially mindful of the eyes when we are playing

with an air rifle or with a bow and arrow. Either one of these dangerous playthings can easily destroy the sight. They should never be aimed at other children or fired in the direction of people. We must also be careful when we are working or playing with anything that may explode. Many eyes are injured from fireworks and explosives on the Fourth of July and from explosions in the chemical laboratory. A good rule is to keep always at a safe distance from anything that may explode. We must watch out too when we are driving nails or breaking hard objects. The force from the hammer may throw the nail or a piece from the hard object directly into the eyes.\*

Bending over in the dark is still another time when we must think of our eyes. Pointed objects sticking up straight may injure them severely and even destroy sight. Holding the hands over the eyes when they are exposed to any kind of danger is always a worth-while precaution.

**Keep out the Germs.**—Germs frequently make trouble for the eyes, and eye diseases caused by germs are usually contagious. Such diseases are also painful, and some of them are dangerous to the sight. Hence, if the eyes become red and itch, smart, or burn, or the lids stick together when we wake in the morning, we should have them examined by the school

\* Anything in the eyes, as a cinder, must be removed as soon as possible, but always by some competent person. Many eyes have been injured by awkward attempts to remove small particles from beneath the lids.

nurse or a doctor. Then if we have a germ disease of the eyes, we must have them treated until they are entirely well.\* But just as important as having the eyes cured, is protection from the germs in the first place. We protect our eyes from germs by avoiding the ways by which the eye germs are spread.

**To Prevent the Spread of Eye Germs.**—You may wonder how germs can pass from one pair of eyes to another. It may be done if the germs in diseased eyes get on to something that will carry them to the eyes that are well. One very common way in which this happens is by the use of the same towel by two or more persons. The person with sore eyes rubs the germs on to the towel, and the one using the towel afterward rubs them into his eyes. One having an eye disease should be careful not to have his towel used by another before it is boiled and washed. But fully as bad as the use of the same towel is the use of the same washbasin by two or more persons. Any one with sore eyes should have a washpan, or basin, of his own, and this should be carefully washed after he uses it.

Some people think that eye diseases can be spread by looking into the eyes of those who have them.

\* One kind of eye disease, called *trachoma* (pronounced trā-kō'-mā), which is rather common in some places, often requires somewhat painful treatments that must be given for some time. On this account, a child with trachoma may stop seeing the doctor before the cure is complete. This is a serious mistake, for trachoma, if it is not cured, may cause blindness. It is also contagious and the one having it may give it to others.



This is not possible. The nurse or the teacher who examines the eyes of children is in no danger of getting dangerous germs if she is careful to wash her hands with soap and water after each examination in which she touches the lids.

**Eyestrain.**—Eyestrain is the name of the trouble one has if he overworks the delicate eye muscles. Muscles on the outside of the eyeballs move them up and down and in and out, while muscles on the inside of the eyeballs focus them upon whatever we look at. If we overwork the eye muscles, they become sore. The eyeballs then get hard, and the eyelids become red and inflamed. If we now go on using the eyes, the strain becomes gradually worse, so that in time we may not be able to use them at all on close work. But even this is not the worst thing about eyestrain.

**Eyestrain and the Nerves.**—Eyestrain is one of the worst of the enemies of the nervous system. It makes one cross and peevish and may cause him to worry about almost nothing. It keeps him from sleeping soundly and from using his mind to good advantage. It is the most common of the causes of headache. Those who have made careful studies of the eyes say that more than half of our headaches come from eyestrain. It is one of the causes of nervous breakdowns, and if it is long continued, it may check the growth.

**Eyestrain and the Appearance.**—Strain may cause the eyes to lose their sparkle, or lustre, and to look dull. It causes the lids and the front of the eye-

balls to become red, or inflamed, and it may cause styes and also scales at the roots of the eyelashes. It often causes ugly wrinkles in the forehead and around the eyes. In fact the whole expression of the face may be spoiled by a bad case of eyestrain. For the sake of our looks, as well as our nerves and the working power of our eyes, we must avoid this kind of trouble. To do this, we must avoid the causes leading up to it.

**The Main Cause of Eyestrain.**—Eyestrain is caused chiefly by putting more work on the delicate eye muscles than they can stand. We may use the eyes too long without giving them a chance to rest. We may study too late at night. We may work in light that is too bright and also in light that is too dim. And we may form habits of using the eyes while in bad positions. But some eyes are strained even when we use them very little and with the greatest care. The cause of this is in the eyes themselves.

**Eyestrain from Eye Defects.**—Very few eyes are entirely perfect. Some have faults, or defects, so great that they cannot work easily either for close work or for distant work. One kind of eye defect is called *long sight*; another kind, *short sight*; another kind, *astigmatism*; and still another kind, *imbalance*. If one has one or more of these defects, the eye muscles will have to work much harder than they would if the eyes were perfect. On this account they will be overworked, or strained, from doing only a small amount of work.

Seeing with defective eyes is like working with a

tool that is in bad condition. If we have to saw with a dull and rusty saw, we become tired and sore from using it only a short time. To saw even a little wood, we must work very hard. Fortunately our defective eyes can be put into good condition, though not in the same way that dull tools are sharpened.

**How Defective Eyes Are Made to Work without Strain.**—The remedy for defective eyes is the wearing of glasses that correct the defects. The eyes are first tested, and the defects measured. Glasses are then ground that correct the defects, whatever they may be. Both the testing and the grinding must be done very carefully, for if the glasses do not fit, they will do little, if any, good. But when glasses are properly fitted and used, the eyes with defects do not have to work harder than they would if they had no defects. This keeps them from being overworked, or strained. Although well-fitted glasses nearly always make one see better, their main use is to cure and prevent eyestrain.

**Glasses and the Appearance.**—Many people needing glasses do not get them because they fear the glasses will mar their looks. Glasses properly fitted and then worn in neatly arranged frames have just the opposite effect. They greatly improve the appearance. They do this by relieving the eyestrain which, as we have already seen, is very damaging to the appearance. By bringing back the lustre to the eyes, clearing up inflamed lids, and driving away wrinkles, the glasses restore the natural beauty of the



face and eyes. Study the pictures on this page to see why the girl looks better with her glasses than without them (Figs. 50 and 51).

**Rest and Sleep for Tired Eyes.**—Eyes without defects can, of course, be overworked. The same is true of eyes with defects that have been fitted with glasses. Whenever our eyes hurt from using them



FIG. 50.—Without glasses



FIG. 51.—The same little girl with glasses

we should stop and give them a rest. When we are reading we can often delay the time for complete rest by lifting the eyes from the page and looking at some far-off object. But the best rest of all for the eyes comes from sleep. In sleep we not only rest the eye muscles but also the nerves used in seeing. By resting the eye muscles and nerves, we can often sleep off the headache caused by eyestrain.

**Light and the Eyes.**—As we have already suggested, the light by which we study should be neither too strong nor too weak. Always, if possible, we should keep bright light from shining directly into the eyes. For reading, the light from the window or the lamp should come to the book from over the left shoulder. To read by light coming from the front or by cross lights is always harmful. Both in the school-room and at home electric lights should either be shaded or placed high up in the rooms so that we do not have to look into them as we work or walk about.

**Eye Needs of Children.**—Childhood is an important period for the eyes in many ways. For one thing, the eyeballs of children are soft and through strain can easily be pressed out of shape. This causes certain defects which are small in the beginning to grow gradually worse as time goes on. *Myopia*, or short sight, if it is corrected at the start amounts to little in preventing good vision. Neglected, it becomes most serious, as is shown by the strong glasses which some myopic people have to wear. If you are unable to read easily what is on the blackboard, be sure to tell your teacher about it at once. The cause may be myopia.

A child will sometimes have one eye which is much more defective than the other, and he will, of course, see better with the good eye. As a result he uses the good eye more and more and the poor eye less and less. If this goes on for some years, he may lose the sight of

the poor eye entirely. But if he obtains glasses that let him see as well, or almost as well, with the poor eye as with the good one, he will keep his sight in both eyes. Just a little help at the right time for children's eyes means much for their future.

**Habit Formation for the Eyes.**—If you do not have these good habits already, begin to form them at once:

1. Being careful in the use of anything that may injure the eyes.
2. Keeping the hands clean.
3. Resting the eyes when they are tired.
4. Sleeping the full time that your age requires.
5. Wearing glasses as needed.

Break any of these bad habits that you may have:

1. Reading when lying down.
2. Reading on moving trains and automobiles.
3. Attending too many picture shows.
4. Reading too many stories.

**Facts Learned.**—(1) Good health, beauty, and ability to work, as well as clear and comfortable vision, all depend upon good eyes. (2) Good eyes, in turn, depend upon how they are used and cared for. (3) We must guard our eyes against accidents, keep them free from germs, and protect them from strain. (4) Since the eyes are most easily injured during childhood and early youth, proper care during this time will help through all the years to come.



## QUESTIONS

1. Give the main uses of the eyes. How do healthy eyes improve the appearance?
2. In what different ways do accidents to the eyes occur?
3. What is one way in which the germs causing eye diseases spread to eyes that are well? Illustrate.
4. Why must one having trachoma go on having his eyes treated even though the treatments hurt?
5. What is eyestrain? How is it caused?
6. How is this trouble relieved and prevented?
7. Fanny has frequent headaches and these are worse when she reads. What is the probable cause?
8. Mary needs glasses, but refuses to get them because she is afraid they will mar her appearance. Is she right or wrong in her decision? Why?
9. Jane has strained her eyes from reading too many stories. Should she read less or obtain glasses? Why?
10. State the importance of proper care of the eyes while we are young.

## CHAPTER XVIII

### THE NOSE, THROAT, AND EARS

Other parts of the body that require attention while we are growing up are the nose, the throat, and the ears. These parts are near together, as you know, and all connect with one another.

**Where the Body's Highways Cross.**—The throat is the place in the body where two very important roads cross. One is the road from the nose to the lungs—the road taken by the air in breathing. The other is that from the mouth to the stomach and is the road taken by what we eat and drink. At this crossing we have interesting arrangements to keep either the air or the food from taking the wrong road (Fig. 52). When we swallow, for example, a kind of lid called the *epiglottis* closes the downward opening toward the lungs, while a kind of curtain called the *soft palate* closes the opening toward the nose (Fig. 53). This checks the air traffic and gives the food the right of way toward the stomach. After swallowing, the tube to the stomach closes, the palate drops, and the epiglottis lifts from the tube to the lungs. This gives the air the right of way both to and from the lungs. (Fig. 52.)

**The Pharynx.**—The place where the food and the air roads cross and a part of the air road toward the nose are somewhat enlarged to form a kind of sack. This sack is called the *pharynx* (pronounced far-inks), and into this you can easily look by standing before a mirror with your mouth wide open. Between the mouth and the pharynx is the soft palate, and where the soft palate joins the throat walls, you

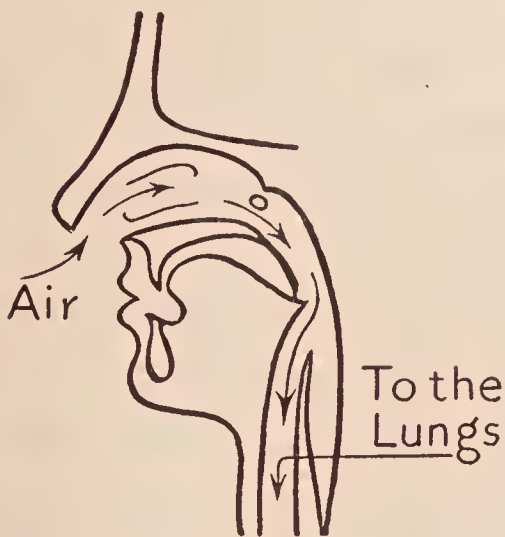


FIG. 52.—Giving air the right of way.

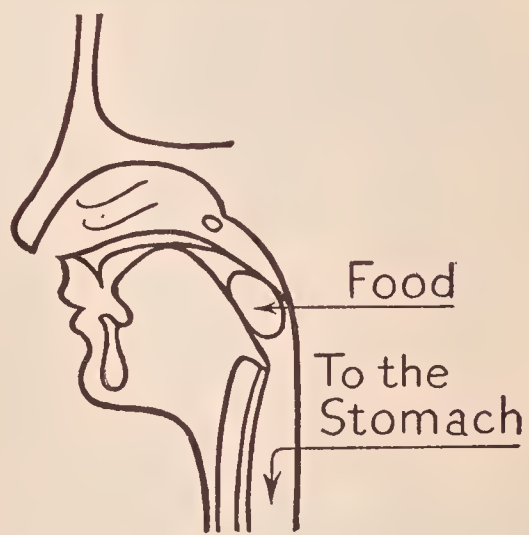


FIG. 53.—Giving food the right of way.

will see the tonsils—one on each side. The pharynx extends upward an inch or more from the part you can see and is joined at its upper end by *nostrils*, which are the openings through the nose.

At the upper end of the pharynx we have what is sometimes called the third tonsil. Enlargements from this, caused by disease, are called *adenoids*. Opening from the upper pharynx on each side and connecting with the middle ear on the same side, is a small tube called the *Eustachian* (pronounced ū-stā'-



kĩ-ăn) tube. This tube lets air pass into and from the middle ear as may be necessary to keep the pressure in this place the same as that of the air on the outside of the body.

**Nose Breathing and Mouth Breathing.**—On account of the crossroads in the throat, air will reach the lungs when it is breathed through the mouth as



FIG. 54.—Mouth breathing spoils the appearance.

well as when it is breathed through the nose. But breathing through the nose is the natural way to breathe, and it is also the way that is best for the body. As the air goes through the nostrils it is cleaned, warmed, and moistened and in this way put in good condition for entering the lungs. When it is breathed through the mouth, it fails to get this preparation. It may be dry and dusty and, in winter, too cold for the lungs.

Mouth breathing is also bad for two other reasons. It spoils one's appearance by forcing him to keep his mouth constantly open (Fig. 54), and it causes one to snore in his sleep.\*

\* Snoring is caused by air striking against the soft palate. When we breathe through the mouth as we sleep, air strikes this curtain in such a way as to make it shake, or vibrate. It is the vibration of the soft palate that causes the noise called snoring.

**Causes of Mouth Breathing.**—There are two main causes of mouth breathing. One of these is habit. The other is necessity. A child with a good throat and nostrils may have a cold in the head and be compelled for several days to breathe through the mouth. During this time he may form the habit of breathing in this way, and he may continue it when the cold is well. But most children who breathe through the mouth do so because they cannot breathe in any other way. Either the nostrils themselves or the upper pharynx just back of them is stopped. The nostrils may be stopped from different causes, and the upper pharynx may be closed by adenoids. Either adenoids or stopped nostrils may force one to breathe constantly through the mouth.



FIG. 55.—To prevent mouth breathing when one is asleep

**To Overcome the Habit.**—If mouth breathing is from habit, one can overcome the habit by constant effort to keep the mouth closed. If the mouth opens while one is sleeping, it is well to tie the jaws together, as shown in Figure 55. It seems that it ought to be easy to break this habit, but many times it is not. One easily forgets his breathing, and when he does this, he starts again to breathe through his mouth. But if he keeps on trying, he will sooner or later win the game. And what a victory for good health it will be!



**Cure through the Doctor.**—If one has obstructions either in the nose or in the upper pharynx that force him to breathe through the mouth, his only chance of ever breathing correctly is to have them removed by the doctor or by the surgeon. Removing them will, of course, hurt somewhat, but it is frequently necessary to suffer pain in order to have better health later on. At any rate, the brief period of pain will be as nothing compared to the continued discomfort, the bad appearance, and the bad health that come from leaving them in.

Even with the obstructions removed, one may find that he will have to form the habit of nose breathing. We have already learned how this may be done.

**We Should Breathe through Both Nostrils.**—Some children find it easy to breathe through one side of the nose and difficult, or even impossible, to breathe through the other. Suppose you close up one of your nostrils with a finger and see if you can draw air easily through the other one. Now try the other side in the same way. Are both sides open and free? If so, they are in a healthy condition. But if breathing is hard through one side, there is something wrong which the nose doctor should correct. Do not put off seeing him if you think something is wrong. Delay is apt to make the condition, whatever it is, worse.

**Inflamed and Swollen Tonsils.**—When the tonsils are healthy, they no doubt serve some purpose, though what that purpose is is not known. In some children the tonsils have become enlarged, or swollen,



and have become sore from germs living in them. Such tonsils do much more harm than they can possibly do good. Germs from them are swallowed with the food and are also taken up by the blood and carried over the body. Rheumatism of the joints, disease of the heart, and other troubles are caused by germs from bad tonsils. A child with enlarged and sore tonsils should see a doctor about them. If the doctor cannot cure them so that they give no further trouble, they should be removed. We should have healthy tonsils or none at all.

**Throat Aid from Warm Feet.**—Have you ever thought that your feet could have anything to do with your throat? They can have a great deal to do with it, as you may see by the following case. A certain woman in a western town had a very bad throat; it had been sore for years. She had gone to different doctors about it, but none of them had been able to help her. Finally a friend told her of a doctor who had cured her of some bad illness. The woman went to this doctor about her throat. He made a very careful study of all the things that might be causing the trouble. He found among other things that she was bothered much with cold feet. They were cold all the time and caused great discomfort. The doctor decided that the cold feet were the main cause for her sore throat, and he soon had her doing several things to warm them up. He made her wear heavy shoes, walk a great deal, take tip-toeing exercises, and sit at times in her bare feet. As her feet got warmer, her

throat got better, and when the cold feet were entirely cured, her throat gave no further trouble.

**A Possible Explanation.**—Our feet are cold when there is too little blood flowing through them. If too little blood goes to the feet, too much must then be flowing to the head, neck, and other parts of the body. For some reason, too much blood flowing to the throat linings makes it easier for the germs to live upon them. Keeping the feet warm by having the right amount of blood flowing through them is a great help in having the right amount of blood flowing to the linings of the throat.

**Expose the Neck.**—People with weak throats often make matters worse by wearing heavy scarfs or furs. Heating the neck in this way has the effect of making the throat linings weaker instead of stronger. The opposite plan should be followed. Except in very cold weather the neck should be kept bare or nearly so, while the rest of the body, especially the feet and legs, should be dressed comfortably warm. When the weather is very cold, we should protect the entire body—the neck as well as the other parts.

**Avoid Colds.**—When colds are frequent and severe, they have a bad effect upon the nose and throat linings. On this account we should have as few colds as possible and manage those that we have in the best way.

**Care of the Ears.**—One of the very best ways of caring for the ears is to keep the nose and throat

healthy. This is because the worst of our ear troubles, such as ear abscess, or “rising in the head,” are caused by germs passing up the Eustachian tubes from the upper pharynx to the middle ears.\* If the nose and throat are healthy, there are no bad germs to enter the tubes. For the sake of the ears, then, as

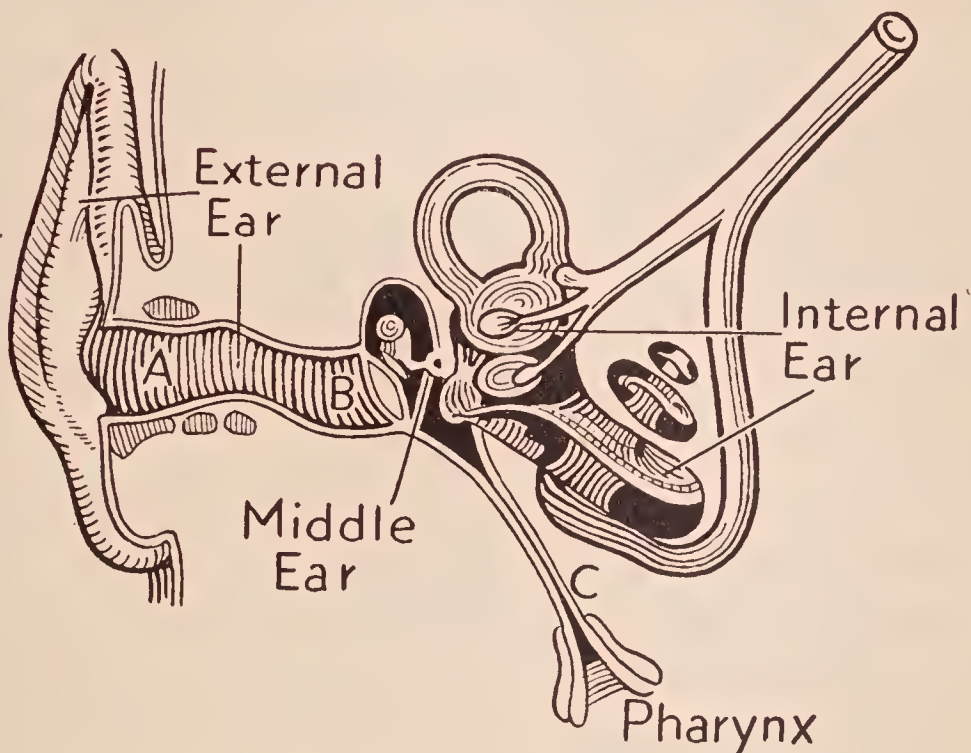


FIG. 56.—Parts of the ear

A. Outer canal. B. Drum membrane. C. Eustachian tube.

\* The ear has three parts, or divisions—the external ear, the middle ear, and the internal ear. The external ear is the part on the outside of the head and the tube running from this to the middle ear. The middle ear is a small air chamber, separated from the external canal by a thin membrane called the *drum membrane*, and connecting with the upper pharynx, as already explained. It has a bridge of three small bones across it for conveying the sound waves from the drum membrane to the internal ear. The internal ear is on the side of the middle ear opposite the external ear. It contains liquids and nerves which receive the sound messages from the bridge of bones and dispatch them to the brain.



well as for the health in general, we must breathe through the nose, have adenoids, bad tonsils, and nose obstructions removed, and avoid colds as much as possible. In addition to this we should learn to blow the nose in a safe way.

**How to Blow the Nose.**—The wrong way to blow the nose is almost to close the nostrils with the fingers and then to blow very hard. The effect of this kind of blowing is sometimes to force air, nose secretions, and germs up the Eustachian tubes to the middle ears. This may cause the painful “risings,” or ear abscesses, that children sometimes have. One can tell when he is likely to do harm in this way by feeling his ear drums push out when he blows.

The right way to blow the nose is to blow it gently and without closing the nostrils too much. If you feel your ear drums press out the least bit, you are either blowing too hard or closing the nose openings more than you should.

**Care of the Outer Ear.**—Although it is not so delicate as the parts of the ear within the head, the outer ear should have gentle treatment at all times. A severe blow on the side of the head may, by driving in the air, injure the drum membrane, and any pointed object thrust into the canal may do the same thing. Even the heavy sounds from explosions may injure the ear structures. This is why soldiers on firing a cannon frequently observe special precautions, such as standing on tiptoe with the mouth open or plugging the ears with cotton.

**To Remove Foreign Objects from the Ears.**—Anything lodged in the outer canal must always be removed by a doctor. He will have the proper instruments and know how to use them. No harm is likely to come from waiting until the doctor can be seen, but much harm may result from awkward attempts at removal with the wrong kind of instrument.

**Trouble from Earwax.**—The familiar earwax, which is secreted by the lining of the outer canal as a protection against germs and small insects, may be a cause of much trouble. If the wax collects on the drum membrane or plugs up the canal, it may cause deafness. This may happen without pain or discomfort in the ears, and perhaps the only warning we shall have will be that we are unable to hear as well as we should. Any one finding that he is not hearing so well as usual or so well as other people should have his ears examined for wax. This examination can be made only by the doctor, and the doctor is the only person who can safely remove the wax when found.

**To Clean the Ears.**—Trouble from earwax is sometimes caused by wrong methods of cleaning the ears. If we push hairpins, nails, or other hard and pointed objects into the outer canal in order to scrape out as much of the wax as possible, we irritate the canal lining. This causes it to secrete more wax than it should and interferes with its natural method of discharge. It must never be done. In cleaning the ears, the rule is to use only a soft cloth and warm water and to

make no attempt to remove more wax than can be obtained by these helps.

. **Protect the Ears at Night.**—A cold draft against the side of the head when one is sleeping, by chilling the surface, may cause too much blood to flow into the linings of the middle ear and the tube to the upper pharynx. This may cause earache and partial deafness. One should, of course, never sleep in a strong draft. One who has had much trouble with his ears, however, may be affected in this way by only slight movements of the air in the bedroom—those necessary to good ventilation. Ears so sensitive as this require special protection at night, such as may be obtained from a sleeping cap made from some light material.

**Habit Formation for the Nose, Throat, and Ears.**—If you do not have these habits already, begin to form them at once:

1. Seeking medical aid for the nose, throat, and ears when it is needed.
2. Breathing through the nose instead of through the mouth.
3. Blowing the nose gently.
4. Keeping the feet warm.
5. Treating one's own ears and those of others gently.

If you have any of these bad habits, begin the work of breaking them today:

1. Bundling up the neck on going out.



2. Wearing furs in warm weather.
3. Blowing the nose with too much force.
4. Inserting hard objects into the ears for removing wax.
5. Sleeping in drafts.

**Facts Learned.**—(1) The nose, throat, and ears are connected in their work, and all require attention while we are growing up. All parts must be kept as healthy as possible. (2) Nose breathing as a habit must be established. (3) Medical aid for the removal of nose obstructions, adenoids, and diseased tonsils and for the protection of the ears and the hearing must be secured when it is needed.

### QUESTIONS

1. Describe the crossroads found in the throat. How is the air and food traffic regulated at this place?
2. Name three good reasons for breathing through the nose instead of through the mouth.
3. How does mouth breathing injure the appearance? How does it cause one to snore?
4. What are the two main causes of mouth breathing? What is the remedy in each case?
5. What are adenoids? Why must they be removed?
6. How can one tell whether he breathes through both nostrils or just one?
7. How may one injure his ears by blowing his nose? Describe a proper method of blowing the nose.
8. When should the tonsils be removed? When should they be left in the throat?

9. How may adenoids and diseased tonsils injure the ears?
10. What harm may come from picking the ears with hard and pointed objects?
11. What kinds of ear trouble require the help of the doctor?
12. What harm to the ears may result from sleeping in drafts?

## CHAPTER XIX

### SKIN AND CLOTHING

The outer covering of the body, called the skin, not only grows as long as the body as a whole grows, but a part of it keeps on growing as long as we live. This may seem odd, but there is a reason for it.

**What the Skin Does for Us.**—The main purpose of the skin is to protect the body. It protects us from hard and rough substances that may rub or strike against us. It protects us from the germs that cause disease. And it protects us from the action of strong gases that may be in the air and from strong liquids that may wet the body. Besides protecting the body the skin acts as an organ of touch, or feeling, and it aids in throwing off waste and in keeping the body from getting too hot or too cold.

**The Skin a Double Organ.**—Our skin is made up of two layers. The outer layer, which we can see and touch, is called the *cuticle*, or scarf skin. The layer beneath the cuticle is called the *dermis*, or true skin (Fig. 57). These two layers are wholly different in their natures and in the purposes which they serve.

**The Cuticle.**—The cuticle, or scarf skin, is made up of several thin layers of cells. While the cells in



its inner layer are alive and growing, the outer cells are dead and have flattened into thin scales that are



FIG. 57.—Our double layer of skin

constantly wearing off. As they wear off, others take their place from below so that a tough layer is always kept at the surface. No

part of the cuticle has any nerves or blood vessels in it, and so it cannot feel pain or bleed when it is hurt.

The cells in the lower layer of the cuticle have pigment, or coloring matter, in them. This gives the skin its color, which, as you know, is different in the different races. As we expose ourselves to sunlight, the pigment becomes darker and we are said to tan. Freckles are caused by the collecting of pigment in small patches in the cuticle.

**Hair and Nails.**—Both the hair and the nails are outgrowths from the cuticle and, like the rest of it, have no blood vessels or nerves. The hair protects exposed parts of the body and improves our appearance. The nails

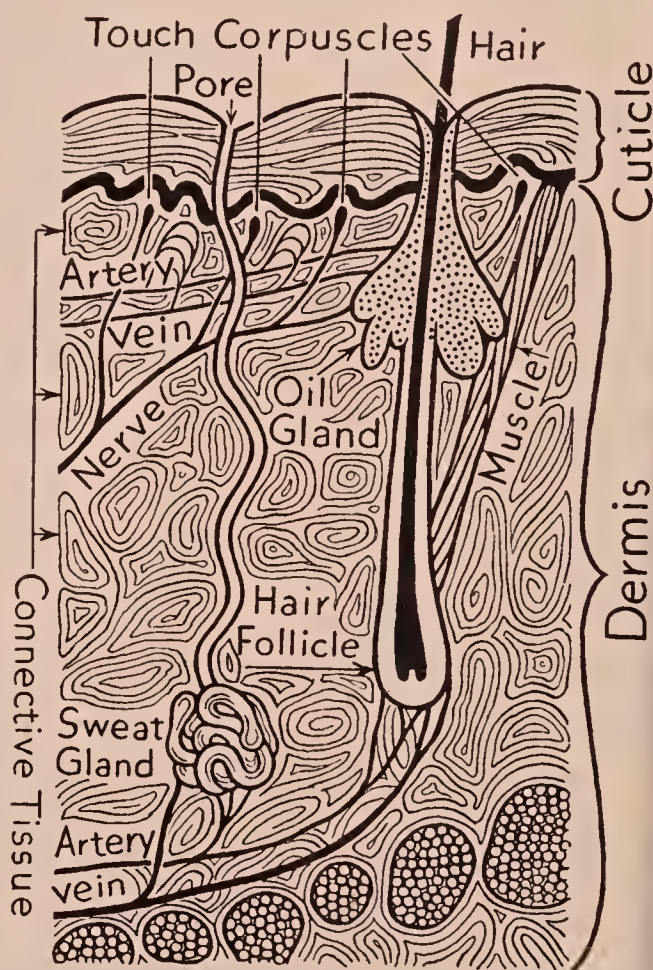


FIG. 58.—Skin structures

protect the ends of the fingers and toes. The finger nails also aid in picking up small objects, as you already know. The hair grows by the addition of new cells at the inner end, or root. This rests in a small cup in the true skin, called the *hair follicle* (Fig. 58). The hair really grows inside this follicle and pushes the outer end farther out so that our hair becomes longer.

The nails grow in length by the addition of new cells to their inner end, or root, and they grow in thickness by the addition of new cells to the underside. When they are not trimmed they become quite long and are much in the way.

**Why the Cuticle Keeps Growing.**—In protecting the body from everything that might injure us from the outside, the cuticle is being constantly worn away. To replace what is lost, the cells next to the dermis must keep on growing and dividing to form new cells. The greater the wear at any place, the faster the new cells form, and the faster they are added to the cuticle. This is because more blood is drawn to these places by the pressure and rubbing that cause the wear. In some cases the new cells are added to the cuticle faster than the old ones are worn away. In this way thick and calloused places, such as corns, are formed.

**The Dermis.**—The dermis, or true skin, is much thicker in most places than the cuticle. It is made up of many fine threads running in different directions, and among these are the following parts:

1. Many small blood vessels. The blood which



these carry not only nourishes the true skin but also the living cells in the cuticle.

2. Many small nerves. These end in tiny, round bodies, called *touch corpuscles* (pronounced kor'-pus-'ls) and give feeling to the skin.

3. Many small tubes, called *sweat glands*. The

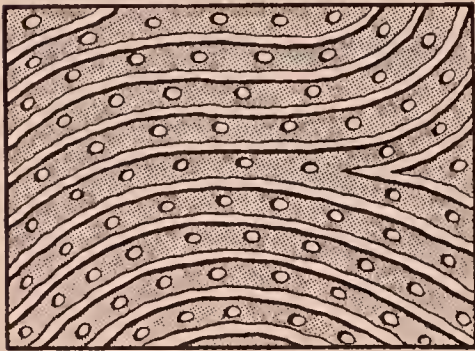


FIG. 59.—Skin pores

inner ends of these tubes are coiled into small balls, while the outer ends pass through the cuticle and open on to the surface. Their openings may be seen in the palm of the hand with a small magnifying glass (Fig. 59). They are called

*pores*. The sweat glands secrete perspiration, or *sweat*.

**Care of the Skin.**—Three kinds of care are needed by the skin. It must be kept clean. It must have exercise in reacting. And it must be protected from germs. The method of keeping the skin clean, as you know, is that of bathing.

**Kinds of Baths.**—For cleaning the entire body we use warm water in a bathtub. The water should not be over 100° F. Before leaving the tub we should turn on some cold water, for this, by chilling the skin, closes the pores and stops the sweating. The body is then quickly dried and rubbed with a coarse towel. A very good bath can be taken without the use of a bathtub, provided the room is comfortably warm. Warm water is applied to the body with a soft cloth



from a pan or washbasin. After this the skin is thoroughly dried and rubbed. If the room is at all chilly, only a part of the body should be exposed and bathed at a time.

**Skin Reactions.**—If we go outdoors on a winter's day the skin first turns slightly pale and then becomes red. It turns pale because the blood at first leaves the skin, and it becomes red because the blood then flows back in larger amounts. The return flow is called the *reaction*. When our reaction is good, the blood continues to flow freely through the skin, making us feel warm and giving the skin a ruddy color. If our reaction is poor, the cold air may keep the blood from returning to the skin, or it may drive it back after it has returned. A great help in avoiding colds and other winter diseases is to have good reactions when we are exposed to cold.

**How We Improve Our Skin Reactions.**—The skin reacts better to cold when it has exercise in reacting. We get this kind of reaction by exposing ourselves to cold for short periods of time, as in dressing in cold rooms, going outdoors on cold days, and bathing quickly in cold water. Of course we must not overdo in exposing ourselves to cold, for the results are often harmful. It is also an aid to our skin reactions to avoid overheated rooms and the wearing of clothing that is too warm. During the hot days of summer we should wear very thin clothing and expose as much of our skin as possible to the air and sunshine.

**Protection of the Skin from Germs.**—As long as the skin is healthy and has no wounds in it, we need not fear germs. It protects itself. But when the skin is broken, cut, or scratched, the germs may get into these places and cause much trouble. Skin protection is, therefore, of two kinds:

1. We avoid all kinds of accidents to the body, as explained later in Chapters XXIV and XXV. In addition to this, we must be very careful in the use of all



FIG. 60.—Steps in caring for a wound

kinds of tools and protect our hands and face when exposed to danger.

2. We treat any skin wound which we receive with some germ-killing medicine, as mercurochrome or iodine first cleaning it with warm, clean water if necessary. We then keep the wound bandaged, putting on a little more of the germ-killing medicine once a day, until it is entirely healed (Fig. 60).\*

\* There are certain kinds of wounds that are very dangerous on account of the germs that may be in them and that need the doctor's help as soon as this can be secured. These include deep wounds from rusty nails and dirty tools, wounds from the bites of dogs and other animals, wounds from explosives, and severe burns. Even the small wounds from Fourth of July explosions are dangerous and should be treated by the doctor.

**Care of the Hair.**—The hair should be brushed and combed daily. Then at times it should be washed, either with water alone or with water and soap. When it is washed with soap, it must be rinsed with clear water before drying. Rubbing and kneading the scalp with the fingers causes more blood to flow to the hair roots, and this makes the growth more vigorous. This is also a good way to prevent baldness. Going bareheaded outdoors is supposed to have a good effect upon the hair.

**To Improve the Complexion.**—The greatest aid to a beautiful skin is good health in general. When we are as well as we should be, the skin is clear and smooth and, from the rich blood flowing through it, has a ruddy color. Such skin requires little attention for beauty's sake besides frequent bathing and the spending of much time outdoors. The "beautifiers" purchased at the drug store, some of which are injurious, can add nothing to the fine complexion that comes from good health.

**The Clothing.**—The hair of dogs and horses, the wool of sheep, and the feathers of birds are parts of the cuticle, and they protect these animals from cold and exposure. In place of these growths we have our clothing, which is sometimes called our extra, or supplementary, skin. It is better for us in many ways than any natural covering that might be grown.

**Use and Care of Clothing.**—The amount of clothing worn should vary with the weather: more should be used when it is colder, and less when it is warmer.



In winter the feet and legs should be dressed as warmly as the rest of the body. Cotton or silk next to the skin and woolen clothing over this are considered best for most people. Another point in the use of clothing is to dress according to our work or play—the rougher the work or play, the more durable should be the material in our clothing.

On retiring at night we should put on our special night clothing and spread our day clothing over a chair to air. It should be a matter of pride to keep our clothing neat and make it last as long as possible.

**Habit Formation for the Skin.**—If you do not have these good habits, you should begin forming them at once:

1. Keeping the skin clean—bathing at least twice a week.
2. Dressing according to the weather—using clothing that is neither too light nor too heavy.
3. Avoiding skin injuries of all kinds as much as possible.
4. Taking proper care of such skin injuries as may occur, both the small ones and the large.

**Facts Learned.**—(1) The skin, or outer covering of the body, protects the body in various ways and aids us in our work. (2) Clothing is like an extra skin in some respects, and it too aids and protects the body. (3) Both the skin and the clothing should be properly cared for.

## QUESTIONS

1. What are the uses of the skin? Name its two layers.
2. What kinds of cuticle are on the body of a bird? On the body of a fish?
3. How does clothing aid the skin in its work? In what ways is it superior to animal coverings that serve the same purposes?
4. In what ways do we care for the skin?
5. Name the different kinds of baths and give their use.
6. When does the skin have a good reaction to cold? What are the advantages?
7. How do we protect the skin from germs?
8. Give some rules for the proper use and care of clothing.

## CHAPTER XX

### GROWTH IN RESISTANCE

As we grow older our bodies become better able to defend themselves against all kinds of enemies, including the germs that cause disease. This is a great aid to good health and should be an encouragement to all who, so far, may have been weak or sickly.

**Our Enemies, the Germs.**—Germs are the supposed cause of all diseases that are contagious, or that one person can take from another. Such diseases include whooping cough, measles, diphtheria, scarlet fever, smallpox, and many others. In order for us to “catch” one of these diseases, some of the germs causing it must first enter our bodies. They must then begin to grow like so many small seeds and form new germs. When a sufficient number of germs have been formed to injure some part of the body or to poison the body as a whole, we become ill, or have the disease.

But getting the germs of some disease does not always mean that we are to have the disease. In many cases the body can keep the entering germs from growing and forming new germs, and this keeps us from becoming ill. The power of the body to do this is called its *resistance*.

**Increase of Resistance with Age.**—The young child will catch almost any contagious disease to



which it is exposed. Later on it will catch fewer of them. By the time one is fully grown the number that will be taken when exposed will be very much fewer. Even the germ diseases that most grown people can take, such as pneumonia and tuberculosis, will not be caught so easily as they would have been at an earlier age. This clearly means that our resistance to germs increases as we move along on our journey of growth.

**Ways by Which Our Resistance Increases.**—There are four main ways by which our resistance to germs is increased. These are as follows:

1. By the natural increase in the strength and toughness of our bodies. To get into the body, the germs must enter at its outer surfaces—the skin and the delicate linings of the nose, throat, lungs, stomach, and other parts. All these parts of the body become thicker and tougher as we grow older.

2. By a quick method for each disease in which we have the disease itself.

3. By a slow method without having the disease.

4. By vaccination.

The last three of these methods need further explanation.

**How We Obtain Resistance by Having a Disease.**—During the time that we are having a germ disease, the germs are formed in great numbers and spread sometimes all through the body. They may injure the body directly, and they also secrete poisons that weaken it and make us feel bad in different ways.

But the body is not so weak at this time as it seems. It is considerably more active in the ways in which it fights germs, and it may be a few degrees hotter, or have a fever.\* It is now making within itself substances which can destroy germs and do away with their poisons. These substances are called *antibodies*. When enough antibodies have been prepared, neither the germs nor their poisons can cause further injury. At this point we begin to recover. The antibodies have given us resistance.

If the antibodies remain with us after we have recovered, and they usually do, they keep us from again having the same disease. In many cases this protection lasts as long as we live.

**Why We Should Avoid Germ Diseases.**—Although having a germ disease is often the quickest and most thorough way of obtaining resistance to it, it is always better if we can obtain this resistance in some other way. Besides the pain, discomfort, and inconvenience of having the disease, there is also considerable danger. One may lose his life in this way, or, recovering, he may have some injury or blemish that remains with him permanently. We should avoid germ diseases whenever it is possible to do so.

On the other hand, if we accidentally catch some germ disease, we should not be frightened on that ac-

\* Most doctors now look upon fever as serving a necessary purpose in the body's fight with germs. The higher temperature is supposed to aid in the production of antibodies. It is nothing that we should worry about unless it becomes very high.

count. Knowing our danger, we should take the best possible care of ourselves both when we are sick and for some time afterwards, following the doctor's advice in all respects. After we have made a good recovery, we can be glad that we have added to our resistance in this way.

**Resistance by the Slow Method.**—In the case of a few diseases, such as whooping cough, scarlet fever, and diphtheria, if one does not have them while he is growing up, he seldom has them at all. We do not know just how we slowly gain this resistance, though it is probably after this manner. The body picks up now and then a few germs of these diseases, but never enough to cause the diseases in the active state. In fighting a few of the germs at a time it finally produces enough of the antibodies to give complete protection.

This natural method of acquiring resistance would be just what we want if only it were more rapid and applied to more diseases. As it is, its value is not very great. Fortunately we have another method of obtaining resistance without having the disease—one which is rapid and in many cases quite sure.

**Vaccination.**—By vaccination we make the body fight germs when we want it to and develop the kinds of resistance we think it needs. We do this by putting into the body preparations called *vaccines*, which contain either the germs in a weakened state or the germ poisons. These excite the body and start it fighting, somewhat as it fights when it has the disease



itself. But it fights mildly and with little or no fever, and there is not the danger from vaccination that there



FIG. 61.—Dr. Edward Jenner

is from the disease. In two or three weeks the body will have made enough antibodies to give good resistance for quite a while.



Vaccination has been studied by many scientists, and we now know how to vaccinate against several diseases. The two most important of these, as far as children are concerned, are smallpox and diphtheria.

**Smallpox Vaccination.**—Smallpox vaccination was the first kind of vaccination practiced. It was first done in 1797 by Dr. Jenner of England (Fig. 61). It consists in making a slight break in the skin and putting into this the smallpox vaccine, which contains weak germs that are very much like the germs of smallpox. As these multiply and spread through the body, the body fights them. In so doing it gives us in a short time enough antibodies for good protection against smallpox. This resistance lasts for about seven years and often much longer. However, it is a good plan to be revaccinated after five years if there should be cases of smallpox in the neighborhood.

**Why Smallpox Vaccination Is Necessary.**—Although smallpox sometimes appears in a mild form in which it does little harm, it is really one of our very worst diseases. In severe cases the body becomes covered with terrible sores, which cause great suffering and very often death. Those re-

covering are badly marked by deep scars, which show the places where the sores were located. The face rarely escapes this marring effect (Fig. 62). Even the



FIG. 62.—A recovered smallpox patient

mild forms of smallpox are dangerous because of their tendency to become more and more severe. Smallpox vaccination gives us almost complete protection against this terrible disease.

**Diphtheria Vaccination.**—Diphtheria is one of the diseases against which our bodies slowly develop resistance without outside aid. It is customary, therefore, before vaccinating a child, to give it a test to see if this resistance is not already strong enough. This is called the Schick test, and it is easily made by the doctor. If the child does not already have enough resistance, a small amount of a liquid having in it a little of the poison from diphtheria germs is placed under the skin with a sharp, hollow needle. As the diphtheria poison spreads through the body, the body starts developing antibodies to overcome it. After two or three doses given a week or so apart, the body will have developed antibodies enough to keep one from catching diphtheria if he is exposed to it. This resistance will last for two or three years and sometimes longer.

**Why Children Should Be Vaccinated against Diphtheria.**—Like smallpox diphtheria is a very dangerous disease. Although we now have our serum treatment for diphtheria \* and this is a great help,

\* The serum treatment is entirely different from diphtheria vaccination. The serum used is a preparation from the blood of a horse and contains antibodies which the horse developed on account of being vaccinated with diphtheria toxin, or poison. Diphtheria serum is of great use in curing the disease because it contains antibodies already



there are still many deaths among children from diphtheria. It is also very hard to avoid exposure to the disease when it is in the neighborhood. For example, a child in school may have diphtheria germs living in his throat. Since the throat is not sore enough to keep the child from school, he is constantly exposing the other children to the germs. Any one innocently exposed in this way is protected if he has been vaccinated, and does not have to make a fight for his life, as he might have to do if he got the disease. Children should by all means be vaccinated against diphtheria.

There are other dangerous diseases against which we should like to be vaccinated if we only knew how this might be done. Scientists, however, are studying the problem, and it may not be long before we can have this kind of protection against measles, scarlet fever, and other dangerous diseases.

**Germ Enemies against Which We Develop But Slight Resistance.**—There are a few germ enemies against which we cannot develop a strong resistance of the kind that we have been studying. One of them is the common cold. In fighting these enemies the body uses other kinds of resistance, as you will learn from the next chapter. The kind of resistance studied in this chapter is called *specific resistance*. Having it for one disease does not protect us from other diseases caused by germs. It must be developed for each disease separately.

prepared. By vaccination we are forced to prepare our own antibodies, which last very much longer than those supplied by the serum.

**Facts Learned.**—(1) Among the important powers which the body acquires as it lives from year to year is the power of defending itself against the germs that cause disease. (2) It gains this power rapidly when it is having a germ disease, but in a few cases it can develop it slowly without having the disease. (3) We can aid the body in this important work by a method called vaccination.

### QUESTIONS

1. What is meant by the body's resistance? Give proof that it increases from year to year.
2. In what ways is resistance acquired by the unaided body? How do we help the body in acquiring resistance?
3. What are antibodies? What have they to do with our resistance? What is the quickest way of obtaining them?
4. What are the objections to obtaining resistance by having germ diseases?
5. How does vaccination protect us against certain diseases?
6. Name the advantages of smallpox vaccination.
7. Why should children be vaccinated against diphtheria?

## CHAPTER XXI

### RESISTANCE AND COLDS

In having a cold we develop a slight resistance against the germs causing it, as explained in the last chapter. This helps us to recover and keeps us from having another cold for a time. Because resistance to colds does not last, we must find other means of fighting these enemies of the body.

**Colds Contagious.**—Though mild in nature, a cold is really disease and is caused by germs. Like other germ diseases it is contagious, or catching. We can catch colds from people by breathing their germs. Here is a parody on an old but well-known rhyme that will help you to remember this important fact.

Mary had a pesky cold;  
It started in her head.  
And everywhere that Mary went,  
That cold was sure to spread.

It followed her to school one day;  
(There wasn't any rule)  
It made the children cough and sneeze  
To have that cold at school.

The teacher tried to drive it out.  
She tried so hard, ker-choo-oo!  
It did not do a bit of good,  
For teacher caught it too.



Since colds are usually mild, people think little about them. They go on about their work, leaving the colds to get well of themselves. This is the wrong way to manage. Neglected colds and neglected conditions causing colds are health enemies and should be treated as such.

**Why We Must Fight Colds.**—There seem to be but two good ways of dealing with enemies. One way is to treat them kindly and change them, if possible, to friends. The other is to fight them. We must deal with colds in the second way and these are the reasons why:

1. Colds are our natural enemies. They are always fighting us. To protect ourselves we must fight them.

2. Colds are wasteful enemies. They attack us frequently and interfere with our work. Investigations show that colds cause more loss of time from work than any other single disease.

3. Colds are dangerous enemies. They weaken us in various ways and make it easy for the germs causing "flu," pneumonia, tuberculosis, and other diseases to get a start. In fighting colds we fight these enemies also.

4. Having colds ourselves endangers other people. If Mary had not had a cold, she would not have taken it to school and given it to the teacher and pupils.

**Weapons for Fighting Colds.**—Fighting colds is a different kind of fighting from that which most boys

and girls know about. You doubtless know how to fight mice and rats and to swat flies (Fig. 63), and you may have seen boys fight each other. Fighting colds is different from all these, because we have to fight enemies too small for the unaided eyes to see. This means that we must fight them with weapons different from those used in ordinary fighting. Five good weapons for fighting colds are the following:

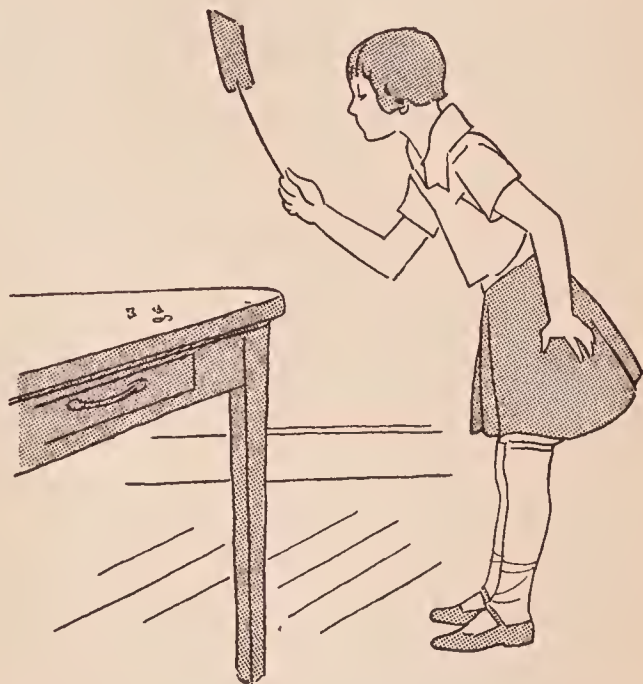


FIG. 63.—A fly swatter in action

1. Healthy linings of the nose and throat, or *good resistance of these parts*.

2. Good health for the entire body, or *good general resistance*.

3. Good judgment both in exposing and in protecting ourselves in bad weather.

4. Extra care while we are having a cold.

5. Thoughtfulness for others.

We must learn how to obtain these weapons and use them to the best advantage.

**Healthy Nose and Throat Linings.**—Some children seldom have colds, while others have them often. There are two main causes for this difference. One cause is the resistance of the body as a whole. The

other is the resistance of the linings of the nose and the throat.\* Doctors and nurses who frequently examine children know what a difference there is between the throats of those who frequently have colds and of those who do not. As a rule, the lining of the throat of the child who seldom has a cold has a light pinkish color, and it and the tonsil on each side are healthy looking and smooth. It has no places in which cold germs or other germs can get a start.

On the other hand, the throat lining of one who frequently has a cold is usually rough and swollen and has a deep red color, or is inflamed. The tonsil on either side may also be rough and swollen and appear unhealthy. Such a throat will have many places in which germs can live and increase in numbers.

**To Improve the Resistance of the Nose and Throat Linings.**—If we have nose obstructions, adenoids, or diseased tonsils that cannot be cured, we should have them removed. This will improve the resistance of the nose and throat linings and do other things which were explained in Chapter XVIII. But the things that we can do for ourselves are fully as

\* According to our present knowledge, the body uses three kinds of resistance in its defense against the germs that cause disease. These are the resistance of the body as a whole, called the *general resistance*; the resistance of its outer surfaces, called the *local resistance*; and the resistance which it develops against different kinds of germs, called *specific resistance*. The first depends upon general good health, the second upon a healthy condition of the body surfaces — the skin and mucous linings — and the third upon the development of antibodies, as explained in the last chapter.



important. These have already been stressed and are as follows:

1. Breathe through the nose instead of through the mouth.

2. Keep the feet warm.

3. Spend as much time as possible outdoors. Fresh, cold air, for reasons not fully understood, has a very beneficial effect upon the nose and throat linings.

4. Sleep in a cool, well-ventilated bedroom and in a warm and comfortable bed.

Finally, when we have a cold we should try to recover as soon as possible. The method by which this is done is explained later.

**To Fight Colds by Keeping Entire Body Healthy.**—Cold germs often get on the linings of the nose and throat without giving us a cold. This is because they are killed by different things found in the blood. The blood has in it a great number of cells, called *white corpuscles*, which destroy cold germs and other germs that cause disease. It also has in it substances besides the white corpuscles that destroy germs and overcome their poisons. When the entire body is healthy, the white corpuscles and other germ-destroying substances can do away with the cold germs as fast as they get into the mucous linings, so that no harm is done. But this power depends upon good health. It is called *general resistance*. To have good general resistance, we must have good health in general and also avoid things that weaken us even for short periods of time.

Many people who are well most of the time take cold, pneumonia, and other diseases because they neglect the rules of health. They overwork or over-eat or let themselves get thoroughly chilled or use alcoholic drinks or do something else that weakens them for a short time. During the time of weakness the germs may obtain a start.

**“Catching” Cold.**—People so often start colds from getting chilled that they think the trouble comes from this cause alone. The name “cold” probably came from this mistaken idea. Colds are from attacks of germs. Becoming thoroughly chilled lowers the body’s resistance so that germs already on the mucous linings can get a start. In this way the cold begins. But we can start a cold for the same reason, and often as easily, by getting too warm.

**Avoid Overprotection.**—A fond mother who prided herself upon the care she took of her delicate son was much disturbed by the frequent colds which he had. She dressed him warmly and in cold weather kept him constantly in the house. She had him sleep in a warm room and kept the windows down tight to prevent drafts. In spite of all this care the boy had a cold almost constantly. Her mistake was that of overprotection. In depriving him of cold, outdoor air she weakened his nose and throat linings. From lack of exercise and from keeping him too warm she lowered his general resistance.

Instead of benefiting her son by her careful treatment the mother was helping the cold germs in their

attacks. Such mistakes are easily made. As far as colds are concerned, underprotection and overprotection are both harmful. We must seek a happy mean.

**Curing the Cold.**—When we have a cold, we should rid ourselves of it as soon as possible. By good management most children can cure their colds in a few days. From bad management a simple cold may last for weeks. Things that we may do to cure our colds quickly are the following:

1. Keep comfortably warm. Becoming chilled starts the cold over again.

2. Stop the usual work and exercise. We must save our energy for fighting the germs.

3. Retire early at night and rise late in the morning. If the cold is very bad, stay in bed.

4. Take no medicine for the cold unless it be something to move the bowels. The medicines that “break up” colds are said to weaken the body and to cause one to take cold more easily.

Finally, we must be sure that we are entirely over the cold before we stop looking after ourselves. It is the nature of some colds to get worse just when we think they are cured.

**Stop the Cold-Spreader.**—Have you ever been a cold-spreeder? Most people have been at some time. It has been only a few years since we first knew that colds are mild forms of disease and that they are contagious. Before people knew they could give the cold germs to others, they followed the plan of going where-



ever they pleased when they had colds. Knowing better now and realizing also that colds are serious, we should follow a different plan. Those who have colds must, as far as possible, keep away from those who do not have them. For example, children with colds should sit apart from the other children at school and avoid playing with them until the worst stage has passed.



FIG. 64.—Catching the sneeze stops disease.

Especially should any one with a cold avoid coughing, laughing, or talking in such a way as to throw his breath into some one else's face. He should catch the cough or the sneeze in a handkerchief (Fig. 64). One who is careful in these and other ways is not a cold-spreader. Instead he is practising a very important rule.

**The Golden Rule of Hygiene.**—Of course you know about the Golden Rule of conduct. It is in the Bible and is one of the teachings of the Savior. Briefly stated, it is, "Do unto others as you would have them do unto you." This applies just as much to the spreading of contagious diseases as to our treatment of people in general. Stated as a rule of hygiene, it would be this:

*As we would that others protect us from their germs, so should we protect them from our germs.*

**Diseases Which Are like Colds in Their Beginning.**—Measles, "flu," scarlet fever, tonsillitis, diph-

theria, and a few other diseases are much like colds when they start and are easily mistaken for them. To have one of these diseases and to act as though we had only a cold is, of course, to make matters much worse. On this account we should stay at home if we have something like a cold that is very severe—something that makes us weak, or feverish, or makes our muscles or our bones ache. This will be better for us, and it may keep us from spreading one of the diseases named above.

**Habit Formation for Colds.**—If you do not have these good habits already, begin to form them at once:

1. Dressing moderately warm in winter and keeping feet warm and dry.
2. Covering the mouth with a handkerchief or the hand when you cough or sneeze in the presence of others.
3. Taking care of yourself when you have a cold.

Break any of these bad habits that you may have:

1. Visiting when you have a cold.
2. Taking quinine or some other medicine to “break up” a cold.
3. Talking or laughing in the faces of others when you have a cold.

**Facts Learned.**—(1) A cold is a contagious disease of a mild nature which attacks the nose and throat linings. (2) It may produce an unhealthy condition in these linings and prepare the way for other and more serious troubles. (3) We must do what we can to

prevent colds in the first place and cure them quickly when they occur. (4) In fighting these small enemies of the body we are also protecting ourselves against such dangerous enemies as pneumonia and tuberculosis.

### QUESTIONS

1. What is the nature of a cold? How are cold germs spread from one to another?

2. Why should we avoid having colds as much as possible? Why should we take good care of ourselves when we have them?

3. How may we fight colds before we have them?

4. What kind of lining in the nose and throat is an aid to the cold germs in getting a start? What kind keeps them out?

5. How does good health protect us from colds?

6. Do we catch the cold, or does the cold catch us? Explain.

7. What changes would you suggest to the mother mentioned on page 188, in the care of her son?

8. How must we manage if we would recover quickly from colds?

9. Why should children with colds at school sit apart from the other pupils?

10. State the Golden Rule of hygiene. Mention some ways by which we may practice it.



## CHAPTER XXII

### MENTAL GROWTH

With the growth of the mind we have an increase in power—not an increase in size and weight, such as we studied in Chapter IV. Mental power, as every one knows, is the most important and wonderful of all our powers. Of course we all want to have as much of it as we can.

**Mental Growth of Many Kinds.**—With the mind we know and remember things, and with the mind we think and reason. We love with the mind, hate with the mind, and through the mind we experience joy and happiness, as well as disappointment and sorrow. It is through the mind, too, that we can control our actions—make ourselves do things that are unpleasant but necessary, and keep ourselves from doing wrong things for which we have formed a habit. There are, as you see, many kinds of mental power. One of the most interesting of these in its growth, or development, is called the intelligence.

**Meaning of Intelligence.**—Intelligence means being able to recognize and understand the things about us, to think and to reason. We have some intelligence at a very early age, but just how early no one

knows. The poet, J. G. Holland, expresses this idea in the following lines:

“Who can tell what a baby thinks?  
Who can follow the gossamer links  
By which the mannikin feels his way  
Out from the shore of the great unknown,  
. . . Into the light of day?”

But our intelligence grows along with our bodies. Have you not noticed that you can do harder things with your mind now than you could do last year or the year before?

**Tests for the Intelligence.**—Students of the mind, called psychologists, have made up a series of interesting tests by which one’s intelligence can be measured. These are not questions calling for information, such as are usually asked at school examinations, but problems that test our power to think and to reason. Some of these tests are so simple that a three-year old child can pass them, while others are too hard for some grown-ups. Between these two extremes are problems that suit all ages from three to sixteen years.

**Intelligence Growth as Shown by Tests.**—The average child of three years can point to different parts of his body, give his family name, and name objects seen in a picture. These are tests for three-year intelligence. When he is four years old, the child can copy a square, tell which is the longer of two lines, and repeat two, eight, five, nine, or some other four digits,

after you. His intelligence has advanced a year. Let four years more pass, and he can count backward from twenty to one, tell the respects in which a ship and an automobile are alike, and name, at sight, six different coins. He now has eight-year intelligence. If he grows normally from now on, he will each year be able to pass harder and harder tests because of his steady growth in intelligence.

**Growth in Knowledge.**—Through his eyes, ears, and other senses, the child is constantly receiving impressions from the world about him. The results of these impressions are stored in the nervous system, and he can recall them at will in memory. He is also impressed by what he does and by what other persons do—by what they say, how they look, and what they do for him and to him. These impressions are also stored away for future use. Each day he learns something new, so that his fund of knowledge grows with his growing body. Our growth in knowledge can also be tested, as you well know.

**Growth in Power of Control.**—The young child has but little control over his muscles, as you can see from the awkward way in which he handles his playthings. He has great difficulty in copying a simple figure or even in following a straight line with a pencil. But we know that this power increases with the years, even with the child whose muscles are untrained. As the muscles are given practice in doing different things, the increase is, of course, more rapid. Control of one's temper also increases from year to year



and it, too, increases more rapidly as one practices control and builds up habits of good-nature and courtesy.

**Will-Power, or Determination.**—The power which we call the will, or determination, is but a part of our general power of control. One who has a strong will and pushes on against difficulties, is said to be persistent, or persevering. Some persons, however, are too persistent in certain ways; they insist on having their own way when they know that the advice of their parents, teachers, and friends ought to be followed. Such persons are called “stubborn.” We should avoid stubbornness, yet it is of the greatest importance that we have will-power enough to overcome difficulties, to control our speech, and to finish any important work that we have started. Will-power, as most mothers know, is shown at a very early age.

Thoughtful mothers do not try to “break” entirely the developing will. They try rather to give it proper direction. The advantage of this kind of treatment comes later in life when every one needs “the will to win,” which means the determination to succeed in what one undertakes to do.

**Growth of the Emotions.**—By our emotions we mean such feelings as love, hate, joy, envy, and cheerfulness. These are shown early in childhood. Even an infant two weeks old shows pleasure by smiling and displeasure by crying. Long before bodily growth is finished or intelligence is fully developed, most of our emotions are about as strong as they will ever be.

As to aiding their development, there is little or nothing for us to do. Our problem with the emotions is one of control.

**Control of the Emotions.**—Some of our emotions, like joy and cheerfulness, are very helpful. They aid us in our work, make us liked by others, and benefit our health. Others, like anger, hate, and worry, are harmful, as a rule. So far as we can, we should cultivate the emotions that are helpful and avoid those that are harmful. This calls for patience and thoughtfulness on our part and the exercise of self-control. But the greatest help of all, perhaps, is the development of a good disposition, as you will see from the next book of this course.

**How We Aid the Mind in its Growth.**—The mind, like the body, needs exercise. Every power of the mind improves when we give it the kind of exercise it needs. We remember facts better when we try to make ourselves remember. We can solve problems in arithmetic more easily when we work out the answers for ourselves. And our will-power, or determination, is increased by overcoming difficulties. There is as much difference between the mind trained through exercise and the untrained mind as there is between the bodies of those who take enough exercise and those who do not.

**Some Points in Mental Training.**—How we use our minds in our mental exercise, or work, however, makes a difference in the effect which this may have upon their growth, or development. If we want a

mind that can think out things, make discoveries, or invent new machines, then we must look for exercise along these lines. For one thing, we must learn to work independently and to think for ourselves. At school the mistake must not be made of accepting too much help from other pupils or the teacher. This

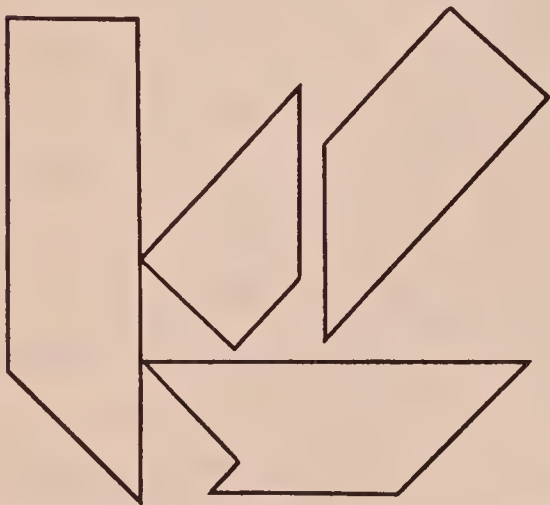


FIG. 65.—Think ahead in working out this puzzle.

deprives one of exercise in thinking. Another good plan is to think out carefully in advance the best way of attacking a problem or of overcoming some difficulty. One of the best ways of trying out this plan of thinking ahead is in the working of puzzles. Of course you are fond of working puzzles.

**An Illustration of Mental Attack.**—In Figure 65 are shown some pieces cut from cardboard. These were obtained by first cutting out the letter **T** and then cutting this into the four pieces shown. The problem is so to arrange the pieces as to again form the letter **T**. Now if we proceed without thinking, trying them first in one position and then in another, we shall probably work a long time before we get each piece where it belongs. On the other hand, if we begin by studying the shapes of the pieces with reference to the shape of the **T**, we shall soon see that the three pieces with square ends must form the three ends of



the **T**. If we then lay these in the only positions in which they can come in the **T**, we shall soon find where the fourth piece must be placed in order to make the letter complete. The right method of attack makes this problem easy.

**How the School Aids in Mental Growth.**—In the first place, the school makes our learning more rapid. By putting our minds to work on definite tasks in learning, we advance many times faster than we should if our efforts were “hit-or-miss.” In the second place, we learn in school the things of greatest value. We learn to read, to write, to solve problems in arithmetic, and to look after our health, because we shall have use for this knowledge all through life. And in the third place, the school gives us more and better training in the use of our minds than we could obtain by our own unaided efforts. What the school does for us, however, depends largely upon what we do for ourselves. Real advancement must come through our own efforts.

**Mental Growth and Health.**—Good health aids mental growth as well as physical growth. In good health we have plenty of bodily energy, are free from aches and pains, and eat well and sleep well. All these conditions aid mental growth in one way or another. Good health also has a good effect upon the emotions, helping us to feel those that are helpful and to avoid those that are harmful. One good way to help our mental growth, therefore, is to do all we can to keep well.

**Value of the Trained Mind.**—The mind that can think and reason and that has been trained to work is perhaps the most valuable thing in the world. Such a mind often makes the difference between success and failure, the difference between health and sickness, and the difference in the length of time that different persons live. Efforts toward obtaining it are certainly worth while.

Although mental growth and development do not stop when bodily growth is finished, youth is the time when most of it occurs. Hence, the advice of Solomon to the young of his day must hold for all time.\*

**Habit Formation and the Mind.**—If you do not have these habits already, begin at once to form them:

1. Controlling your temper.
2. Thinking for yourself.
3. Finishing all worth-while tasks that you have started.

If you have any of these habits, begin at once to break them:

1. Drawing hasty conclusions.
2. Seeking help on things that you can do for yourself.
3. Worrying about trifles.

**Facts Learned.**—(1) Mental growth is growth in

\* "Wisdom is the principal thing; therefore get wisdom. And with all thy getting, get understanding. Forsake her not and she shall preserve thee: love her and she shall keep thee . . . Take fast hold of instruction; let her not go: keep her; for she is thy life." Selections from *Proverbs*: IV.

the most important of all our powers. (2) It is of different kinds, some of which can be easily studied. (3) Growth in intelligence, in knowledge, in self-control, and in ability to use the mind can be noticed from year to year. (4) While the mind grows naturally, as the body does, we can aid and direct its growth in many ways.

### QUESTIONS

1. What do we mean when we speak of the intelligence? What is the proof of its increase from year to year?

2. Give some tests for four-year intelligence. For eight-year intelligence.

3. At about what age might we expect one to work without help the puzzle given on page 198? Give reason for your answer.

4. In what different ways may we aid our mind in growing?

5. What is the difference between thinking and remembering? Which do you consider the more important? Why?

6. In what ways does the school aid in our mental growth? How do we help the school in helping us?



## CHAPTER XXIII

### OTHER FORMS OF MENTAL GROWTH

Along with our growth in intelligence and knowledge and our ability to use the mind, we develop certain traits, or qualities, that have a great deal to do with our success and with what people think of us. Chief among these are courage and self-confidence, dependability, patience, coöperativeness, and good character.

**Growth in Courage and Self-Confidence.**—To see what advance we make during our growing years in courage and self-confidence, we need only to compare children of two or three years with young men and women of eighteen or twenty. At three we have timid little creatures who shrink from all kinds of danger and often cry when they are left alone. At eighteen we have young men and women who seek adventure, laugh at danger, and in athletic battles are not discouraged by painful bruises and broken bones. Our growth in courage and self-confidence is truly wonderful.

**Courage and Self-Confidence as Preparation for Living.**—Life has dangers that must be faced by all. There are dangers in crossing streets and railroad tracks, dangers from riding in boats and automobiles

and on trains, dangers in running all kinds of machinery, and dangers in having different kinds of disease. A self-confident and courageous person is one who can keep cool and think clearly in the presence of danger. He is not reckless or careless; in fact he may be overcautious. But in facing danger he is not overcome by fear. He can use all his powers to avoid or ward off whatever threatens his safety.

**Helps in the Development of Courage and Self-Confidence.**—A great help in gaining courage and self-confidence is to meet bravely any kind of hardship or trouble that one may have. To suffer pain for the sake of better health later, to tell the truth when this means punishment, and to act as a brave person should act when in the presence of danger are all ways of exercising courage. The result will be to increase one's courage.

Another good help is to use reason and common sense in deciding what is really dangerous. Some little children fear darkness, others fear spooks and ghosts, and others fear men with long beards. Reason and common sense tell us that darkness can harm no one, that spooks and ghosts do not exist, and that men with beards are no more dangerous than men without beards. Why should we be afraid when there is no cause for fear?

Still another good help is to learn to control the things that may cause injury. As we feel more confidence in our ability to protect ourselves, we cease to fear. Lindbergh, for example, found that his cour-

age as a flyer was greatly increased when he learned to make descents from his plane in a parachute (Fig. 66).

**Growth in Dependability.**—When John was six

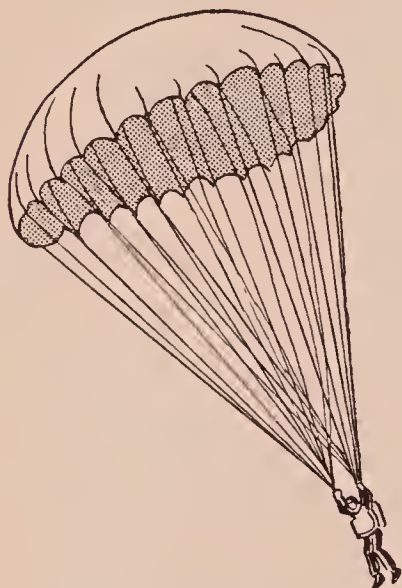


FIG. 66.—Knowing how to save oneself in serious danger gives courage.

years old, his mother gave him some peas to plant in rows already marked out in the garden. She showed him how to plant each pea and cover it up in the row. But John did not want to plant peas; he wanted to play instead. When his mother had gone into the house, he dug a few shallow holes in the rows and dumped all the peas into these holes. He then drew dirt over the rows in order to make them look as though he had planted the peas as

told. John at six was not a dependable gardener.

Later when the peas came up in bunches where he had made the holes, his mother knew just what John had done. She felt badly about it, but did not punish John. She thought that perhaps she had asked him to do something beyond his age. Instead, she ex-



plained what his failure to carry out orders meant to their food supply for the summer. There the matter was allowed to rest.

The next year John was given the same task. This time he planted the peas exactly as he had been told. They came up in beautiful rows and bore a good crop. Thus at seven John was dependable so far as planting peas was concerned. He had grown in dependability.

**Training in Dependability.**—Would John have planted the peas the second time as he was told had he not had his lesson the year before? It is doubtful. Training of the right kind is a very great help. Parents who realize the importance of such training begin with their children very early in life. The child of two or three is required to look after his playthings, putting them away when he is through playing. Later he is taught to run errands and required to care for any pets he may have. As he grows older he is held responsible for greater duties but for none greater than he can do. While training by others is helpful, the best training is that which we give ourselves.

**Results from Self-Training.**—Since dependability means ability to do what we agree to do and what is expected of us, we have but one thing to keep in mind as we work for improvement. This is to do as well as possible all our duties—the small ones as well as the large. If we have made an appointment, we keep it. If we owe a small debt, we pay it. If mother has a job for us at home, we do not disappoint her. If we have agreed to distribute circulars from house to house, we

do it at the time we are supposed to. As we become dependable in little things, we form habits that make us dependable in things that are harder and more important.

**Dependability in Modern Life.**—Have you ever happened to think that we are all more or less dependent upon some one else for something we need or for aid in our work? If the person upon whom we depend fails to do what is expected, we are at a disadvantage. We may fail in our tasks because we did not get the expected help. In the same way we may cause others a great deal of trouble if we fail often to do what is expected of us. People can live and work together in the modern way only when each person is dependable and each does his part.

**Patience.**—Patience means willingness to try again when our efforts so far have not been successful. No doubt you admire the graceful airplane as it soars overhead. But have you read of the number of airplanes built by Wilbur and Orville Wright, the inventors, before they could make one that would fly at all? It is this way with most things that are worth while in life. To succeed finally we must keep on trying. But patience also means the willingness to wait when waiting is necessary. Many things, like the growing of crops, the training of children, and the building of a fortune by honest means, cannot be hurried. We must work patiently for a long time.

Patience, as a rule, develops slowly. It increases with experience in living and by our putting into prac-

tice the patience we already have. Of course we should all cultivate patience.

**Growth in Coöperativeness.**—Ability to work and to play with others is an important as well as a pleasing quality. Its development starts early in life. It is seen first, perhaps, in the desire of small children to help their parents and in their willingness to share their playthings with one another. Soon after this comes the pleasure of having playmates and a few years later the greater pleasure of working and playing with schoolmates. Then in playing athletic games boys and girls have to coöperate with their team mates. These and other steps lead up to the different kinds of coöperation in which we must play our part when grown.

**Train for Coöperation.**—Some children lag behind in their play and so are not much sought after in playground contests. They do not coöperate with other children easily and quickly. To use the playground expression, they do not “get into the game.” If you have this fault, you should try to overcome it. Study your games and improve your playing at points where you are weak. Be loyal to your leaders and in actual playing do what is expected of you. All this is good preparation for whatever you are to do in later life.

**Growth in Character.**—The character of a person is a combination of qualities, some of which have already been studied. Dependability, courage, honesty, faithfulness, loyalty, fair-mindedness, and several others make up the list. Just as there is growth



in courage and dependability, there is growth, or development, in the other qualities that make up character. One's character is sometimes confused with his reputation, though the difference is clear and distinct. Our reputation is what people in general think of us. Our character is what we really are.

The best test of our character is found in our treatment of others, including their property. If we are honest in our dealings and treat our neighbors as we want our neighbors to treat us, we can be pretty sure that we are developing a good character.

**How Character Grows.**—Growth in character depends upon the habits we form. As we act again and again in the same way under like circumstances, we build up habits that cause us to go on acting in a certain way whether it is good or bad. So, you see, one who would build a good character must control his acts. By our acts we form our habits, and through our habits we form our character.

**Habit Formation for Mental Traits and Good Character.**—If you do not have these good habits, begin at once to form them:

1. Overcoming the little fears of everyday life.
2. Performing simple duties and keeping promises.
3. Trying again when first efforts fail.
4. Coöperating with others when coöperation is a part of the game.
5. Being honest under all circumstances.

**Facts Learned.**—(1) While we are growing in knowledge and intelligence, we are building up all the

time certain traits or qualities. (2) These include courage and self-confidence, dependability, patience, coöperativeness, and good character. (3) While all these traits grow naturally to some extent, we can aid them in their development and thus add greatly to the final results.

### QUESTIONS

1. Why do we need courage and self-confidence in everyday living?

2. How is one to overcome groundless fears? How may he become brave in the face of danger?

3. When is a person said to be dependable? Why is dependability a quality that all should cultivate?

4. How do parents develop dependability in their children?

5. Give an example of coöperation. How does being dependable help one to coöperate?

6. What is meant by one's character? How does it differ from one's reputation?

7. How does one develop a good character from day to day?

8. Mary was sent to the store to buy groceries. Her mother gave her a dollar and told her to keep what was left when the groceries were paid for. The clerk in giving Mary the change made a mistake of ten cents in her favor. This she promptly returned. What were the advantages to Mary from being honest?

9. Lucy has the habit of getting angry and of causing a "scene" whenever she fails to have her own way. While this is hard on her parents and friends, is it also hard on Lucy? Why?

## CHAPTER XXIV

### AVOIDANCE OF ACCIDENTS

Journeys of all kinds are frequently delayed and sometimes stopped altogether by accidents. Our journey of growth is no exception. To make our

growth journey safe and successful, we must avoid all kinds of serious accidents.



FIG. 67.—A common accident that may be easily prevented

#### **What Accidents Are.**

—Accidents are happenings that occur without our expecting them. A boy going to school trips on a loose board and falls (Fig. 67). This is an

accident. It was unexpected. The results of such an accident are usually slight—a spilled lunch, soiled clothes, and perhaps bruised hands and knees. But accidents are often serious. Legs and arms are sometimes broken, and deaths by accidents are all too common. It is because of the serious nature of accidents that we should study to avoid them.



**Why Accidents are Preventable.**—Although accidents occur without our planning for them, they are always the result of some cause. If we make a study of the causes of accidents and then avoid or remove the causes, we can avoid the accidents themselves. It is said that most accidents are the result of carelessness. This means that people do not look for the causes of accidents as they should and do not remove the causes that they know to exist.

**Causes of Accidents.**—There are many causes of accidents and some of them we need not think about at this time. But we should know the causes of the accidents that are occurring every day about us, especially the causes of these six kinds:

1. Falls.
2. Burns.
3. Accidents from water.
4. Accidents with firearms and explosives.
5. Accidents with automobiles.
6. Accidents with street cars and railroad trains.

The causes of accidents of the first three kinds are considered in the present chapter, and causes of the last three kinds, in the chapter which follows.

**Causes of Falls.**—One common cause of falls is lack of skill in balancing the body and in moving about. Nature has given us two wonderful instruments for keeping ourselves in an upright position. They are found in the skull bones close to the ears, one on each side of the head. They are called the *semicircular canals*. When we lose our balance, or

start to fall, there is a slight movement in our balancing instruments that makes us straighten up, or catch ourselves. We do this without thinking. Lack of skill in keeping the body balanced may be from some fault in these instruments, but it is more apt to be from some other cause. One may not be keeping his muscles and nerves in good condition by exercise, he may not have had enough practice in keeping his balance under different conditions, or he may be wearing the kind of shoes that make his balancing difficult.

A good exercise in keeping one's balance is to walk a narrow board set firmly on edge, as shown in Figure 68. Balancing over one foot, as in hopping, is another good exercise for this purpose.

**Faulty Footwear a Cause of Falls.**—In standing and in moving about our weight is balanced over the feet, as you learned from Chapter XV. The kind of shoes which one wears, therefore, makes a difference in one's ability to balance the body. Shoes with broad toes and low, broad heels give us a broader base over which to balance the body and so are less apt to make us fall than shoes with narrow toes and high and narrow heels. If the girls with the high heels and narrow toes do not believe this, they should try walking a board set on edge.

**Causes of Falls outside Ourselves.**—The boy who stumbled over a loose board in the walk would not have stumbled if the walk had been in good repair. The same may often be said of those who stumble or who miss their step about the school or the home.

We must find these causes of falls and remove them before the falls occur. We find them sometimes in broken steps leading into the house or down into the basement, sometimes in rough stones lying in paths which we must follow, sometimes in loose wires or sticks that may cause us to trip, and sometimes in



FIG. 68.—An exercise for the balancing centers

holes into which we may step at night. Children are often as quick as grown people at finding such causes.

**Falls from Climbing.**—Children like to climb, and it would be unwise, perhaps, to take this pleasure away from them. They would miss opportunities for developing courage and the ability to keep cool under trying circumstances. But children must learn to use care and good judgment in this kind of play. In climbing about in trees one must be sure that a branch is strong enough to hold him up before putting his



full weight upon it (Fig. 69). He must have a firm hold upon the next branch before releasing his hold where he is. And he should not attempt feats of climbing that are too difficult or too dangerous.

If other children urge or dare him to climb where



FIG. 69.—Dangerous exercise unless it is carefully done

his better judgment tells him not to go, he must follow his own judgment. It is better to be laughed at than to risk getting a bad fall.

**Dangers from Ladders.**—The ladders on which workmen climb to the roofs of houses and the stepladders on which they stand in working on side walls and ceilings may cause accidents if they are not strong or if they are not properly placed. Many workmen have been injured from this

cause. All ladders should be frequently inspected and used with care. Young children should keep off ladders altogether.

**Danger from Burns.**—Every one knows how much pain may come from even a small burn. To be badly burned over a large part of the body is not only pain-

ful, but may cause death. Burns may come from the things heated by fire or electricity as well as from fire directly. The most dangerous of the hot substances used about the home is, without question, hot water. It is used for many different purposes and is easily spilled in pouring from one vessel to another. Children should also keep at a safe distance when the water in the radiator of a car starts boiling. But it is in the use of fire for heating our homes and for cooking that we are in greatest danger of burns.

Although small children should avoid fires altogether, those from eleven to thirteen years of age are old enough to begin the work of kindling and managing them. Their first efforts, however, should be under the direction of older and more experienced persons.

**To Kindle a Fire Safely.**—In kindling a fire we must begin with something that will start burning from the tiny flame of a match. The best thing for this is wood shavings. Upon the shavings we place some fine sticks or twigs and upon these some pieces that are slightly larger and then the fuel itself. If the fire is to be in a stove, a good plan is first to place in the back of the fire box a large stick of wood. Then in front of this we build up the pile of kindling, standing the pieces at different angles to give a better draft. When this is built and the fuel is placed on top, we apply the lighted match to the shavings (Fig. 70). The stove drafts should be open as the fire starts, but should be closed when it is burning well. A fire

started in this way can be safely managed and will do no harm. But there are ways of making fires that are very dangerous.

**Kerosene Dangerous for Kindling Fires.**—Many serious accidents have come from the use of kerosene, or coal oil, in kindling fires. Because kerosene burns easily and in burning can ignite large sticks of wood, it is sometimes used to save the time and trouble of

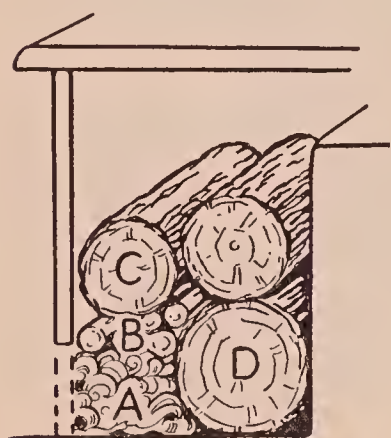


FIG. 70.—How a fire should be laid

preparing and laying the kindling. It is poured on the fuel itself and the match applied. Danger comes from the fact that the heat changes the kerosene into a gas, and this, on mixing with the air in the stove, explodes. The explosion throws the burning liquid out into the room and sometimes upon the one who is making the fire.

While it is possible to make a fire with kerosene, this should not be attempted even by grown people. It is too dangerous.

**Danger from Gasoline.**—Gasoline is even more dangerous than kerosene for kindling fires, and people have learned never to use it for this purpose. Most of the accidents from gasoline are from its use as a cleaning fluid and as a fuel in automobiles. Gasoline dissolves grease and so can be used for removing grease spots, as well as for cleaning clothing that might shrink if it were washed in water. *On account of the rapid evaporation of gasoline it may reach a fire*



*many feet away from where it is being used, and ignite.* The result is instant burning, or explosion.

Cleaning with gasoline, if done at home, should always be outdoors and away from fire of any kind. But an even better plan is to use one of the non-inflammable cleaners now on the market.

Accidents from the use of gasoline in automobiles are the result of its leaking from tanks and other containers and getting afire. We should never strike a match where there is the odor of leaking gasoline. To prevent a possible fire when a car upsets, we must turn off the ignition immediately. The ignition must also be turned off when the gas tank in the car is being refilled.

**Danger from Illuminating Gas.**—There are two great dangers from the use of manufactured, or illuminating, gas in the home. One is from breathing the unburned gas and getting in this way the poisonous carbon monoxide. The other is the danger from bad fires and explosions. We protect ourselves in both cases by avoiding leaks in the gas pipes and the tubes connecting them with burners and by making sure that the burners are completely turned off when not in use. As in the case of gasoline we must never strike a match in a room in which there is a strong smell of gas.

**How Fires Spread.**—Fire does its greatest damage when it spreads from the place where it starts to other places. There is no limit to the distance a fire will travel if there are things to burn and these are close

enough to catch, one from the other. This is illustrated by the plan followed, sometimes, by farmers in clearing their fields of rubbish. They rake the rubbish into long rows and light these at the ends. The fire then travels toward the farthest end in each case, the burning rubbish setting fire to that which is next in the row (Fig. 71).



FIG. 71.—Fire spreading through rows of cornstalks and stubble.

It is the spreading of fires from where they start that causes the great fires which destroy whole forests and burn down blocks upon blocks of city property. You may have read about these fires and also about the brave men who risk their lives in fighting them. We can prevent the great fires as well as the small ones by avoiding the causes by which they start.

**To Avoid Fires.**—Rules that should be followed by old and young alike for preventing fires are the following:

1. Never start a fire close to the house or an out-building. The fire may spread to it.
2. Never make a fire outdoors when there is a strong wind. Wind greatly increases the danger of spreading.
3. Always extinguish an outdoor fire before leaving it. Campers in woods cause many fires because

they do not always observe this rule. Every particle of the fire should be extinguished before camp is broken.

4. One who smokes should never throw the lighted match into anything that will burn. If he smokes cigarettes, the burning stub must be extinguished before it is thrown away. Careless smokers have been the cause of many bad fires.

5. If your clothing catches fire, lie down at once so that some one can cover you with a coat, cloak, or some other heavy clothing. If this cannot be done immediately, roll over and put out the flames. Never run with the clothing on fire. This will make it burn all the faster.

6. See that hot ashes from the stove or the furnace do not come in contact with anything that can burn. A metal receiver for them is safe and should be used.

7. Be sure that the stovepipes and flues have no holes through which fire can reach the wood of the house.

8. If the chimney burns out, see that sparks falling on the roof do not set the shingles on fire. Have some quick way of getting water to the roof in case a fire starts.

9. Use illuminating gas and gasoline with the greatest care.

**Treatment for Burns.**—Even a slight burn may prove dangerous if germs get into the sore and start an infection. Only the greatest care can prevent this in some cases. In treating a burn, first smear the in-



jured surface with picric acid ointment or unguentine. If neither of these is at hand, use baking soda dissolved in water. If a blister forms, the skin enclosing the fluid should not be broken, but should be punctured with a sterile needle when it is necessary to let some of this fluid out. A little of the fluid should remain over the sore for protection and as an aid in healing.

When the blister skin finally breaks, the entire sore should be covered at once with some mild, germ-killing substance, such as mercurochrome. This must be renewed every day, and the sore kept bandaged until it is entirely well. When burns are at all severe, we should quickly see a doctor.

**Accidents from Water.**—More lives are lost by water accidents than by fire accidents. Every summer there is a long list of victims, mostly boys, who have been accidentally drowned. In avoiding accidents by water, as in avoiding accidents by fire, we must have good rules to follow and then follow our rules. While one could hardly remember rules for avoiding all the possible accidents that might occur from water, there would be a great saving of life if only the following were remembered and put into practice.

1. Never go swimming alone, but only when some experienced swimmer is with you.

2. Never swim out over your depth unless you are perfectly sure that you can take care of yourself in deep water.

3. Never dive into any kind of pool without first

investigating the depth of the water and the condition of the bottom.

4. Never undertake long feats of swimming until you have become an expert and then only when a boat is along to pick you up in case of trouble.

5. Be careful in all kinds of boating. Be sure the boat itself is safe and never overload it. Avoid rocking the boat either for fun or in changing your position.

6. Never try to ford a swollen stream unless you are sure of its depth and the condition of the bottom.

7. In skating avoid thin ice and also the ice that is beginning to thaw.

**Facts Learned.**—(1) To have our journey of growth free from serious accidents, we must early form the habit of being careful. (2) We must guard against falling. (3) We must exercise care in handling hot substances and use fire in ways that make it a friend instead of a foe. (4) In swimming, boating, skating, and in crossing streams we should never do what our better judgment forbids.

### QUESTIONS

1. What is an accident? Why can we say that accidents are preventable?

2. State the general plan of preventing accidents.

3. Describe anything you saw on your way to school, around your home, or about the school building, that might cause one to fall.

4. Why is climbing especially dangerous? What precautions should be taken in climbing trees?

5. When is fire a good friend? When a bad enemy?

6. Describe a safe method of kindling a fire.

7. Give three or more rules for avoiding destructive fires.

8. A little girl playing near an open grate had her clothing catch fire. An older sister ran out of the house to tell her father. Before he could reach her and extinguish the flames, she was so badly burned that she died. In what different ways could her life have been saved? Which of these would have been the best?

9. What precautions should be taken by those in swimming? By those boating? By those crossing swollen streams?



## CHAPTER XXV

### OTHER WAYS OF PREVENTING ACCIDENTS

After an accident has happened, it is easy, as a rule, to see how it could have been prevented. Studies of this kind are useful in keeping similar accidents from happening again. But serious accidents should, if possible, be kept from occurring in the first place.

**Accidents from Explosives.**—Boys have a natural fondness for firecrackers, toy pistols, and small torpedoes, as well as for the shotguns and rifles that are used in killing game. The extent to which our boys should be permitted to indulge this fondness is a question upon which parents and teachers do not always agree. Where the boy lives also makes a difference, for the danger from this cause is far greater in the city or village than it is in the country. There are two general ways of avoiding accidents from firearms and explosives. These are:

1. By keeping firearms and explosives entirely out of the hands of small children and also from the larger boys who are careless.

2. By handling firearms or explosives as carefully as possible.

Being careful with firearms includes many things that all hunters know. It means care in the loading

and unloading of guns, care in avoiding their accidental discharge, and care when firing at game or at targets to see that people or domestic animals are not in range.

**Accidents from Playing with Guns.**—Some rough boys think it good sport to point guns supposed to be unloaded at other boys in order to frighten them. While no harm is usually meant, many accidents have occurred in this way. It frequently happens that guns that are not supposed to be loaded have had loads in them. Make it a rule never to point a gun at any one or, better still, never to play with firearms of any kind.

**Small Wounds Dangerous.**—Many of the children who lose their lives from Fourth of July accidents do not die from the wounds themselves, but from germs that cause *tetanus*, or lockjaw. Even the smallest wounds from toy pistols, firecrackers, or other explosives should be treated by the doctor. By the proper use of medicines he can kill the germs and overcome their poisons. In this way he can prevent the serious trouble that might otherwise result.

**Accidents from Automobiles.**—Automobiles are to-day the greatest of all the causes of serious accidents. More than thirty thousand persons are killed each year in the United States by automobiles and not less than three hundred thousand are injured. Some of those killed and wounded are car occupants. They are hurt when their cars crash into other cars, are struck by trains at railroad crossings, or overturn

and roll down embankments. The others are people on foot who are run over by swiftly moving cars on city streets and country roads. In both classes are many children. The main causes of automobile accidents are three in number, as follows:

1. Unskilled and careless drivers.
2. Cars in bad condition so that they cannot be driven in a safe manner.
3. Carelessness on the part of pedestrians.

In preventing accidents by automobiles, we must work to overcome each of these causes.

**The Trained and Skillful Driver.**—The well-trained driver not only knows what he should do under any circumstance that may arise, but he has formed habits that enable him to do the right thing quickly and without having to think about it. How to start and stop the car, turn it in different directions, increase and diminish its speed, brake with the engine when this is necessary, signal with the hands and the horn, and do the other things necessary to good driving, are quickly learned by one of average intelligence. But to form habits that will enable the driver to do the right thing quickly in an emergency takes time and much driving.

**The Careful Driver.**—The careful driver is one who is thoughtful for the safety of his passengers and car and also for the safety of pedestrians. He governs his speed according to the condition of the road, the nearness of other cars, and the people who may be on foot. He observes the rules of the road, obeys the



signals from traffic officers and stop lights, and makes sure that every safety device about his car is in good condition. He is a driver with sharp eyes, who keeps them constantly on the road. And he avoids situations like that shown in the picture (Fig. 72).

**The Safe Car.**—A driver who is very careful and skillful is still in danger of accidents if his car is not in good condition throughout. With poor brakes he may not stop quickly enough to avoid a collision. With poor lights or a dirty windshield he may go over

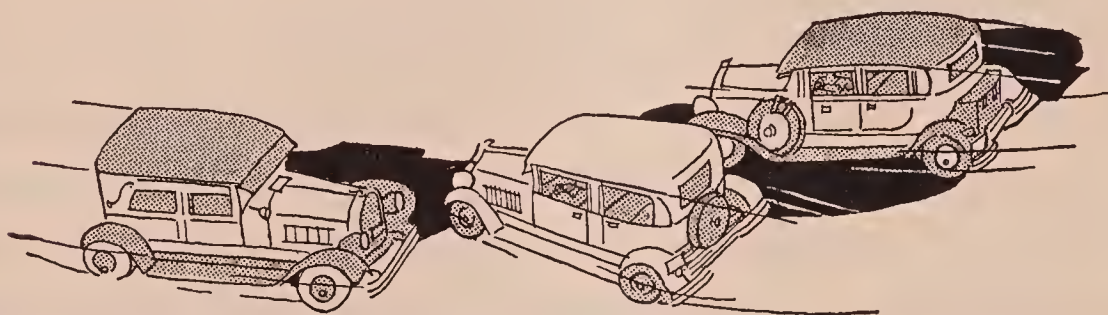


FIG. 72.—How may an accident still be prevented?

an embankment at night. With badly worn tires he may skid on wet roads or be overturned from a blow-out on a front wheel. With a bad steering wheel he may be unable to dodge another car or someone on foot. And with a weak horn his signals to other cars and to pedestrians cannot be heard. For safe driving the good condition of the car is just as important as skill and carefulness on the part of the driver.

**The Careful Pedestrian.**—Many of the accidents to those on foot are due to carelessness on their part. Failing to look either way before crossing a street or a road, they seem to expect the driver of the car to slow

his speed or stop entirely if this be necessary for their safety. The careful driver will, of course, do this if he sees the pedestrian in time and his brakes are in good condition. But the pedestrian should never take this risk. For his own safety he should observe carefully the following rules:

1. Always look both ways for approaching cars before crossing the street or the public road.

2. Observe traffic regulations and obey all signals and warnings of danger.

3. Always observe the speed of an approaching car and never attempt to cross the street unless there is plenty of time. Do not depend upon the driver's slowing down for you.

4. In crossing a street or road at night, take extra precautions. The driver may not see you at all.

**To Cross City Streets Safely.**—City streets should be crossed only at the regular crossings. Three times as many accidents occur from people crossing streets between crossings as occur at the regular places. So we should walk straight across, and not attempt to go diagonally to the farthest corner (Fig. 73). On most of our streets and public roads the automobiles

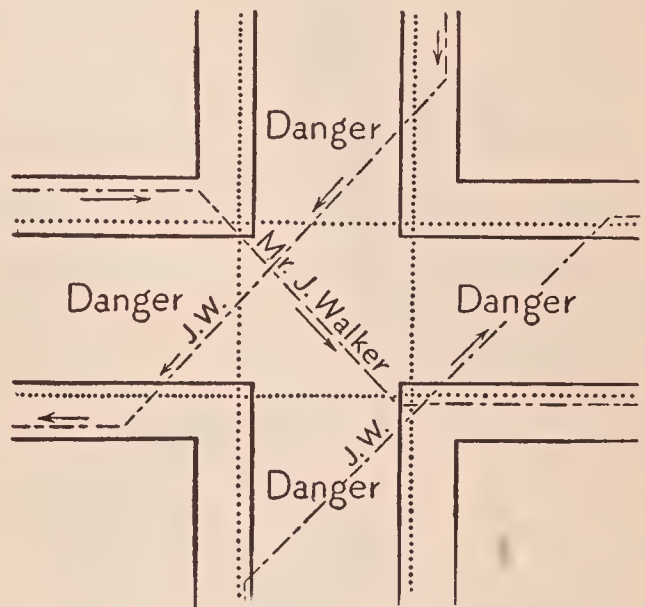


FIG. 73. Where would the safe walker's tracks be?

pass in one direction on one side and in the opposite direction on the other, each row of machines keeping to the right. This makes it necessary for those on foot to look in one direction as they start across and in the opposite direction when they reach the middle,

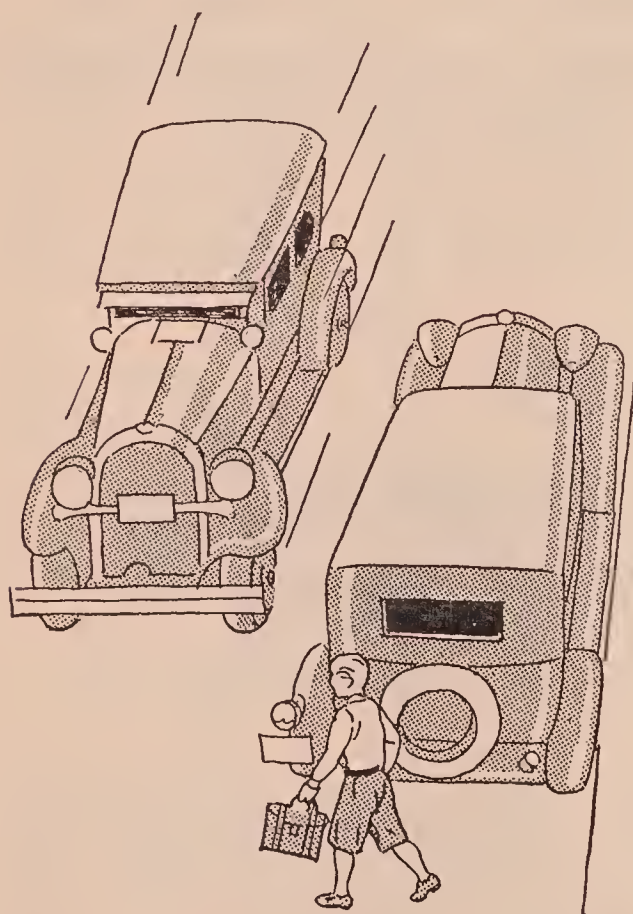


FIG. 74.—The greatest cause of accidents to pedestrians

in addition to avoiding the street cars and railroad trains if there are any. The thicker the traffic, the more careful one must be, and it is a great help to have a traffic officer at the worst places. His signals must be heeded by all.

Perhaps the greatest of all the causes of injury to foot passengers is from people's stepping from behind street cars, trucks, or other cars directly in front of moving automobiles (Fig. 74). Think how hard, and often impossible, it would be for the driver to keep from hitting you under such circumstances, and then resolve never to be careless in that respect.

**Care in Playing.**—Most of the accidents to children have come from their playing in streets and roads that are used by cars. Interested in their play, they



often run directly in front of a moving automobile. When this happens, the most careful driver is sometimes unable to stop in time to prevent a serious accident. This cause, like most of the others, is easily avoided.

**Why the Young Should Not Drive.**—Many boys and girls are much interested in automobiles and know how they should be driven. They often wonder why there should be laws to keep them from driving. One reason is that most boys and girls under sixteen have not yet learned to be as careful as automobile drivers are expected to be, and another is that they are apt to get excited under trying circumstances. Besides, there are times, as when a front wheel unexpectedly strikes a hard object, when an adult's full strength is needed to hold the car in the road. Everything considered, driving an automobile is a kind of work that belongs to mature life. Ambitious boys and girls can well afford to wait until they are fully capable in all respects.

**Accidents from Street Cars and Railroad Trains.**—Accidents from street cars and railroad trains are quite similar in their causes to accidents from automobiles. Hence, those who are careful in the avoidance of automobile accidents are not likely to have accidents with street cars and railroad trains. Before crossing the tracks we must look both ways, and we must take no chances by running across just ahead of a car or the train. We might trip and fall. And then we should not attempt to mount or step off street cars

or trains while they are moving. Even when they have fully stopped we should watch our step to avoid falling.

**The Dangerous Railroad Crossing.**—Railroad crossings are dangerous to those in automobiles and wagons, as well as to foot passengers, and many persons are crippled and killed at these places every year. The greatest care is necessary at such crossings to prevent serious accidents. Fortunately, the most dangerous of such crossings are being rendered safe for all by bridges and viaducts that take the railroad either above or below the road for wagons and automobiles.

**Facts Learned.**—(1) Accidents from firearms and explosives, accidents from automobiles, and accidents from street cars and railroad trains are frequently of the most serious kind. We must do our best, therefore, to prevent them. (2) While most of this preventive work must be done by mature people, children also have a part. They can look out for themselves and they can remind others to be careful. (3) Children who early learn to do these things, will seldom have their growth journey interfered with by serious accidents.

### QUESTIONS

1. Describe some bad accident that you know about and tell how it could have been prevented.
2. How may accidents from firearms be prevented?
3. What two dangers are there in the use of fire-

crackers and other explosives on the Fourth of July? Can you suggest some safer method of celebrating this day?

4. Name the three main causes of automobile accidents.

5. Describe the well-trained and skillful automobile driver.

6. Show that safe driving also depends upon the condition of the car.

7. Why is it more dangerous to cross a street between crossings than at the regular place?

8. In crossing a wide two-way street or road which way should one look before he starts? When he reaches the middle? Can the same rule be followed if the road is narrow? Why?

9. Give five rules for pedestrians in avoiding automobile accidents. Five rules for the drivers of cars.

10. How can accidents from street cars and railroad trains be avoided?



## CHAPTER XXVI

### OUR MATURITY

All journeys finally come to an end, and all travelers reach some kind of destination. The destination which we reach by our journey of growth may or may not be all that we hope for. It all depends upon the way in which we have traveled.

**Our Maturity.**—Our maturity is the period following our period of growth. It lasts as long as we then live. It is the time when life reaches its most complete stage and the time when we accomplish our real aims and purposes. Before this time everything is growth and preparation. In the early part of this period men and women get married and start homes of their own, and all through this period they strive to attain their ambitions. It is a time when people should have health and strength, courage and self-confidence, trained minds, and the ability to work. Without these they are at a great disadvantage. It is just here that many are disappointed.

**What Maturity Means to Some and What to Others.**—To see that maturity does not mean the same to all, we need only observe our young men and women. They are just entering this period, but how differently. Some are straight and well-formed;

others are out of shape and slouch over as they walk. Some are enthusiastic and hopeful, while others are gloomy and discouraged. Some are the pictures of health, but others are weak and sickly or are tied to health-destroying habits. Many have fine minds and a good education, though a few, alas, can scarcely read and write. From these differences we must expect some to gain much more happiness and success as mature persons than others.

Now let us ask ourselves this question: "What kind of mature person do I want to be?" We should ask this question seriously, for *what one wants to be will have much to do with what he finally becomes*. Especially will this be true of those who do all they can to make their dreams and wishes come true.

**How Roosevelt Won the Kind of Maturity He Wanted.**—As a small boy Theodore Roosevelt was weak and sickly. He could not play rough games as other boys could, and in any kind of fight he always got the worst of it. When he was no older than you are now, he realized that if he was ever to amount to anything as a man, he must have more physical strength and better health. He went to work to build up his body and improve his health. He had many things to overcome, but he kept on trying. The result was that he grew into a very strong and capable man—quick in his muscles and also in his mind (Fig. 75). No one doubts that the fame that Roosevelt enjoyed as a man was made possible by what he did as a boy to aid his health and growth.



**Our Maturity What We Make it.**—Of course we all have to grow up and we shall do this whether we think much about ourselves or not. Our body cells take care of our growing. But our natural growth does not always go on in the best way, and it is not sufficient for us as human beings even when it does.



FIG. 75.—Theodore Roosevelt—a strong man who started life as a weak boy

To make our growth journey safe, successful, and happy, we must help it in a number of ways. We must plan for the things that are best for us when we are through growing, and see that our plans are carried out. It will help us in our planning to mention briefly some of the things we hope to realize as mature men and women.



**All That We Should Have and Be When Grown.**—For one thing, we should have well-formed and straight bodies. These will add greatly to our appearance and aid us in keeping well. Then we should have strong muscles and steady nerves, and our bodies should be solid and firm throughout. This will be better for our health, better for our work, and better for helping us stand all kinds of strain. Furthermore, we should have well-kept and skillful hands, well-shaped and healthy feet, a clean and healthy mouth, a healthy nose and a healthy throat, eyes that see well and look well, and heart and other organs within that easily do their different kinds of work.

But if our growth journey has been successful and happy, as well as safe, we shall have more than a strong and healthy body. We shall have a trained mind, a good character, and the ability to make our way in the world.

**To Become the Kind of Men and Women That We Want to Be.**—We become the kind of men and women we want to be largely by the efforts we make *before our maturity is reached*. If we can keep ourselves straight all along our journey of growth, we shall be straight when we arrive at our destination. If we build firmness and strength into our bodies by daily exercise, we shall have these qualities as mature men and women. If we keep our hands, feet, mouth, eyes, and other organs healthy, they will be healthy when we are grown. And the mental power, character, and disposition which we develop while we are

young are ours during maturity. Each day for the young person can be a day of preparation for his maturity. Whether or not it is used as such is quite a different matter.

**The Inner Urge.**—No one, apparently, can force the young person to do all for himself that needs to be done in order to arrive at an ideal maturity. The advice and suggestions of parents, teachers, and friends will help, but for any great degree of success he must depend upon himself. He must have a strong and deep desire to make the best growth and development that is possible for him to make—a desire that makes him careful and watchful in everything pertaining to health, that makes him earnest in his mental work, and that makes him diligent in habit formation of the right kind. *Only the right kind of inner urge can finally bring the journey of growth to its most desired destination.*

That each pupil studying this course has already developed such an urge is the earnest wish of the writer.

**Facts Learned.**—(1) Maturity is the destination we reach by our journey of growth. (2) It is the time when physical growth is finished and when our life's work should begin. (3) It means vastly more for some than for others because of the difference in daily preparation that has been made for this period.

## QUESTIONS

1. Describe the part of life which we call maturity.
2. Which is more important, the period of growth or the period of maturity? Give reason for your answer.
3. Account for the differences which we find in the health of mature people.
4. How did the late President Roosevelt reach the kind of maturity that he desired?
5. Enumerate some of the things we should have and be when we are mature.
6. In becoming the kind of men and women we want to be, why can we not depend upon growth alone?
7. What is meant by the inner urge? How do we obtain it?
8. Write two or three paragraphs on the subject: "How I may become the kind of grown person I want to be."



## CHAPTER XXVII

### GROWING AND LIVING

Perhaps you have begun to imagine that our journey of growth is a difficult one to make. To be sure, there are many things to watch out for while we are making it, but it is really quite easy, as you will presently see.

**Our Journey of Growth and Our Journey of Life.**—Our journey of growth is but a part of a much longer and even more wonderful journey—the journey of life (Fig. 76). Any kind of journey may, as you know, be broken into parts. We might, in traveling from New York to Chicago, go first to Cleveland. Stopping there for a while, we might then travel on to Chicago. This would break the entire trip into two parts, the first reaching to Cleveland. Our journey of life is likewise made up of parts, the first of which we have been studying. While we are growing up, we are also living. Until maturity is reached, the two journeys are the same, or, to speak exactly, the one is included in the other. This is why helpful growth and development are easy and simple. All that we need to do for good progress on our growth journey is to live as we should from day to day.

**Living and Growing.**—The young person who

lives right in all respects will grow right at the same time. There is no question about this. Right living keeps the body healthy, and good health is our best aid to growth. But right living does not concern itself alone with the present. It looks ahead; it prepares for the future. Right living during the growing period, then, will not limit itself to physical growth.

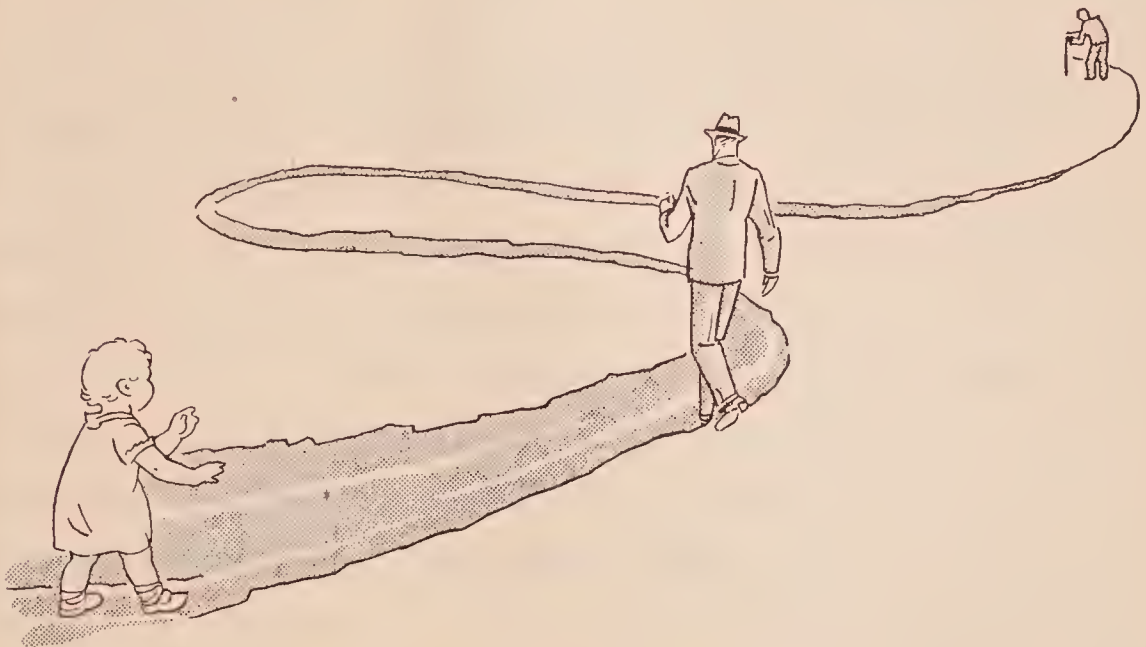


FIG. 76.—Our journey of life

It will provide for mental growth and the other things needed during our maturity. It will be easy, therefore, for us to fit our plans for growing into our regular scheme for living.

Those who have studied the problems of living are agreed upon certain principles that should be practiced from day to day. These principles, properly applied, will give the needed aid for all our different kinds of growth. Of course we should know about these principles.

**Principle I. Living Healthfully.**—Living healthfully is the broadest of our principles and for some it is the one most difficult to apply. It means supplying the body with everything it needs, such as food, water, air, sunshine, exercise, sleep, and protecting it from all kinds of harm. Although we have already learned much about healthful living, there will be more to learn as we become older. The second book in this course continues the study of this principle.

**Principle II. Living Cheerfully and Happily.**—The principle of happy and cheerful living refers especially to our life of feeling, or emotion. We are, as you know, constantly experiencing feelings of some kind, either pleasant or unpleasant. If these are of an agreeable or happy nature, the effects upon growth and development are good. They improve the health, make all our work easier, and aid greatly in the building of a happy disposition.

**Principle III. Living Earnestly.**—We must agree with the poet, Longfellow, that “life is real, life is earnest.” \* It has problems that are hard to solve and rough places that are hard to pass over. We must make good use of our time and work hard when this is necessary. And since our time and energy are both limited we must use them upon worthwhile things.

**Principle IV. Living Honestly.**—Honesty is said to be the keynote of character. If we are honest in our conversation and honest in our dealings with

\* From “The Psalm of Life.” The entire poem may be read in connection with this chapter.



others, the other elements of character will almost take care of themselves. The greatest rewards of being honest are, of course, to ourselves—rewards in the confidence which people have in us and rewards in character formation of the right kind.

**Principle V. Living Carefully.**—Nearly everything we use in our living has in it an element of danger. Fire, water, electricity, gas, machinery of all kinds, tools for cutting, domestic animals, railroad trains, and automobiles can all cause serious accidents and even death. They are good servants but hard masters. Any one of them can interfere greatly with our journey of growth. We use them without injury to ourselves or danger to others by living carefully.

**Principle VI. Living Courageously.**—Although we should protect ourselves by carefulness and forethought, we must not let foolish fears weaken our nerves or excite us when we face actual danger. Every one should have courage enough to protect him from any fear of what might happen in ordinary work and living. With this start he can develop the greater courage necessary in dangerous occupations, such as the construction of buildings and the operation of machinery.

**Principle VII. Living Sensibly.**—Of course we can live sensibly in a number of ways. One way is to practice thrift, saving our money in order to obtain a financial start. Another way is to form no bad habits—those that waste money, or health, or that cause trouble with other people. And another way is to

seek medical aid when this is needed. We live sensibly in a general way when we plan always to do what is best under all circumstances.

**Principle VIII. Living Helpfully.**—Since in our daily living we are constantly needing and receiving help, it is only fair that we be helpful in our turn. But in helping others we also help ourselves. We become more thoughtful for others and less selfish, and we develop habits of dependability. Being helpful to others is also a source of great happiness.

**Principle IX. Living Attractively.**—Who does not desire the admiration and approval of those about him? This natural feeling quite often causes us to do things of great value to ourselves. To make ourselves physically attractive, we keep clean, dress neatly, and keep our bodies in good shape. To be mentally attractive, we cultivate our minds and use good judgment and tact in our treatment of others. And to be socially attractive, we are kind and sympathetic and do what we can to make others happy. All this tends to develop qualities and powers that will help us get on in the world. When it is not overdone, it is a most valuable principle.

**Principle X. Living Enthusiastically.**—To some persons life is dull and gray. To others it is bright and interesting. The difference lies largely in the persons. One gives little and obtains little in return. The other gives much and receives much. To live enthusiastically is to put joy, happiness, good will, kindness, and helpfulness into our living. We shall se-

cure a good return upon these investments. We may well believe with Emerson that "nothing great was ever achieved without enthusiasm." \*

**Facts Learned.**—(1) Our journey of growth is the first division of a larger journey—the journey of life. (2) Because of this fact our plans for growth can be included in our plans for living. (3) By living healthfully, happily, earnestly, honestly, carefully, courageously, sensibly, helpfully, attractively, and enthusiastically, we shall grow as we should and reach, finally, our desired maturity. (4) Growing in the best way is thus accomplished by living in the best way through the growing period.

### QUESTIONS

1. What is the relation between our journey of growth and our journey of life? How does this simplify the work of looking after growth?

2. Which three of the principles of right living do you consider the most important? Give reasons for your selection.

3. Name two or three other principles that might be added to the list.

4. What kinds of growth are secured by Principle I? By Principle IV?

5. Which of the principles aid in mental growth? Which ones in the development of a good disposition?

\* Essay: "Circles."



TABLE I

WEIGHT—HEIGHT—AGE TABLE FOR BOYS OF SCHOOL AGE

Height (inches)	Average weight for height (lbs.)	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	19 Years	Height (inches)
38	34	34	34														38
39	35	35	35														39
40	36	36	36														40
41	38	38	38	38													41
42	39	39	39	39	39												42
43	41	41	41	41	41												43
44	44	44	44	44	44												44
45	46	46	46	46	46	46											45
46	48	47	48	48	48	48											46
47	50	49	50	50	50	50	50										47
48	53		52	53	53	53	53										48
49	55		55	55	55	55	55	55									49
50	58		57	58	58	58	58	58	58								50
51	61			61	61	61	61	61	61								51
52	64			63	64	64	64	64	64	64							52
53	68			66	67	67	67	67	68	68							53
54	71				70	70	70	70	71	71	72						54
55	74				72	72	73	73	74	74	74						55
56	78				75	76	77	77	77	78	78	80					56
57	82					79	80	81	81	82	83	83					57
58	85					83	84	84	85	85	86	87					58
59	89						87	88	89	89	90	90	90				59
60	94						91	92	92	93	94	95	96				60
61	99							95	96	97	99	100	103	106			61
62	104							100	101	102	103	104	107	111	116		62
63	111							105	106	107	108	110	113	118	123	127	63
64	117								109	111	113	115	117	121	126	130	64
65	123								114	117	118	120	122	127	131	134	65
66	129									119	122	125	128	132	136	139	66
67	133									124	128	130	134	136	139	142	67
68	139										134	134	137	141	143	147	68
69	144										137	139	143	146	149	152	69
70	147										143	144	145	148	151	155	70
71	152										148	150	151	152	154	159	71
72	157											153	155	156	158	163	72
73	163											157	160	162	164	167	73
74	169											160	164	168	170	171	74

Prepared by Bird T. Baldwin, Ph.D., and Thomas D. Wood, M.D.,  
from records of 74,000 healthy American boys and 55,000 healthy American

TABLE II

## WEIGHT — HEIGHT — AGE TABLE FOR GIRLS OF SCHOOL AGE

Height (inches)	Average Weight for height (lbs.)	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years	11 Years	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	18 Years	Height (inches)
38	33	33	33													38
39	34	34	34													39
40	36	36	36	36												40
41	37	37	37	37												41
42	39	39	39	39												42
43	41	41	41	41	41											43
44	42	42	42	42	42											44
45	45	45	45	45	45	45										45
46	47	47	47	47	48	48										46
47	50	49	50	50	50	50	50									47
48	52		52	52	52	52	53	53								48
49	55		54	54	55	55	56	56								49
50	58		56	56	57	58	59	61	62							50
51	61			59	60	61	61	63	65							51
52	64			63	64	64	64	65	67							52
53	68			66	67	67	68	68	69	71						53
54	71				69	70	70	71	71	73						54
55	75				72	74	74	74	75	77	78					55
56	79					76	78	78	79	81	83					56
57	84					80	82	82	82	84	88	92				57
58	89						84	86	86	88	93	96	101			58
59	95						87	90	90	92	96	100	103	104		59
60	101						91	95	95	97	101	105	108	109	111	60
61	108							99	100	101	105	108	112	113	116	61
62	114							104	105	106	109	113	115	117	118	62
63	118								110	110	112	116	117	119	120	63
64	121								114	115	117	119	120	122	123	64
65	125								118	120	121	122	123	125	126	65
66	129									124	124	125	128	129	130	66
67	133									128	130	131	133	133	135	67
68	138									131	133	135	136	138	138	68
69	142										135	137	138	140	142	69
70	144										136	138	140	142	144	70
71	145										138	140	142	144	145	71

girls. Used through the courtesy of the American Child Health Association.

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